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VISUAL CONDITIONERS OF ORAL RESPONSE: A PSYCHOLINGUISTIC  
APPROACH TO THE TESTING OF SECOND-LANGUAGE LEARNING

by



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A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled " Visual Conditioners of Oral Response: a Psycholinguistic Approach to the Testing of Second-language Learning" submitted by Karl Aston Gordon in partial fulfilment of the requirements for the degree of Master of Education.





## ABSTRACT

The main purpose of this study was threefold: (1) to compare two different types of visual stimuli (fixed and animated) in order to judge of their relative effectiveness, wholly or in part, in testing second-language learning that has been audio-visually conditioned; (2) to discover how well pupils can verbalize within contextual situations in a second language, when cued by purely visual stimuli (familiar or unfamiliar); (3) to find out which of the two types of visual stimuli functions more effectively overall as a testing instrument. Five null hypotheses were formulated to answer the questions implicit in this stated purpose of the study.

Fixed and animated visual stimuli (i.e., filmstrips and moving picture respectively) without sound were used for testing. These two types of visual stimuli are similar to those of the two audio-visual programs used for teaching beginning French at the Grade 4 level in Alberta - Bonjour Line, a filmstrip and tape program, and Parlons Francais, a moving picture program.

Four groups of thirty pupils each comprised the randomly selected testees used in the project. These groups were made up as follows: Group A (experimental) - familiar with the fixed visual stimuli only; Group B (experimental) - familiar with the animated visual stimuli only; Groups C and D - unfamiliar with both the fixed and the animated visual stimuli. The pupils of all four groups started the study of French at the same time, the control groups having identical audio-lingual programs of instruction,



and the two experimental groups each having one or other of the two above-mentioned audio-visual programs.

All the testees were required to give oral responses in French to the visual cues of silent films and filmstrips. The testing was carried out in language laboratories where pupils' oral responses were recorded on magnetic tapes. Various measuring devices were used to evaluate these responses, and the resultant data were then analyzed statistically and tested for significance.

The major findings were as follows:

1. Both silent films and filmstrips are capable of eliciting oral responses that indicate a degree of proficiency in understanding and interpretation of purely visual stimuli.
2. Fixed visuals (i.e. filmstrips) are easier to understand and to interpret than animated visuals (i.e. motion picture).
3. Fixed visual stimuli function more effectively overall as a testing instrument than do animated visual stimuli.
4. Familiarity with a given type of visual significantly influences oral performance when cues for response are visual only.
5. The presentation of filmstrips, frame by frame, may be a safe predictor of how well pupils are likely to perform when asked to relate a situation, which unfolds over a sequence of frames. However, it is difficult to attempt to use such a method to predict performance on films presented in their entirety.
6. The effectiveness of an audio-visual foreign language teaching program can be partially tested in respect of its goals by the use of its visual component only.





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## CHAPTER I

### THE PROBLEM AND DEFINITIONS OF TERMS USED

The use of audio-visual second-language teaching programs to initiate instruction in French is now in vogue in a number of elementary schools on the North American Continent. This is especially true of many elementary schools in Alberta. Currently, the trend is for some schools to use the motion picture program, PARLONS FRANÇAIS<sup>1</sup>, and for others to use the filmstrip and tape program, BONJOUR LINE<sup>2</sup>. For the most part, in Edmonton, Alberta, instruction in French begins in Grade Four, and where offered is compulsory for all pupils at that level. It is important, therefore, to know whether the oral performance of these pupils in the target language is in any way related to the different audio-visual, instructional media by which they have been trained.

#### I. BACKGROUND TO THE PROBLEM

"It is generally accepted that there are four chief kinds

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<sup>1</sup>Parlons Français - Film Course Heath de Rochemont Corp., Boston 16, Mass., 1961.

<sup>2</sup>Bonjour Line - Méthode d'enseignement du Français aux enfants étrangers de 8-11 ans., C.R.E.D.I.F., Publiée sous le patronage de l'Assoc. pour l'éducation, la Science et Culture, Chilton Co. Book Division (Publishers) Philadelphia, N.Y., 1963.



of skills which can be attained in different degrees in learning a language: understanding, speaking, reading, and writing. The mixture in which these four separate goals are weighted or brought into play in any particular program of instruction varies widely."<sup>3</sup> In the light of this observation, it is of the utmost importance that the various teaching methods employed to effect the attainment of these four skills be subjected to very searching and exacting empirical studies in order to determine the merits and demerits of each, a problem which Corder, in his article 'Language Teaching by Television,' describes as follows:

"Our task, as I see it now, is to press on with experiment and research; experiment in a more radical behavioral type of teaching program on the one hand, and research into the psychology of language and the study of language in situation, on the other."<sup>4</sup>

Two areas which demand such a program of research are those of listening and speaking, the skills which are given main emphasis in audio-lingual second-language teaching programs. Many are convinced that these skills represent fundamentally essential goals in the learning of a foreign language. Carroll gives as justification for this emphasis the fact that "language is first of all a system

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<sup>3</sup> John B. Carroll, Research on Teaching Foreign Languages, College of Literature, Science, and The Arts, The University of Michigan, Ann Arbor, Michigan, 1961, p. 3.

<sup>4</sup> S. Pit. Corder Language Teaching by Television, in Trends in Language Teaching (ed. Albert Valdman) Indiana University, McGraw-Hill Book Company, New York/St. Louis/San Francisco/Toronto/London/Sydney. 1966., p. 251.





for social communication..."<sup>5</sup> Hodgson maintains that "familiarity with the articulated noises which constitute speech must be the prerequisite for any ability to write down those noises."<sup>6</sup> In similar vein, the Memorandum on Modern Language Teaching states that "the conscious aims in our teaching should be:

1. To make the ear hear unfamiliar sounds.
2. To train the mouth to make unfamiliar sounds."<sup>7</sup>

The above quotations are representative of the attitude of many foreign language specialists with a wealth of experience in foreign language teaching and research. It is perhaps for this reason that in recent years great emphasis has been placed on the importance of the audio-lingual skills in modern foreign language teaching programs. In fact, the majority of studies done to test the effectiveness of audio-lingual second-language programs (among them Agard & Dunkel, 1948, Cheydleur & Schenck 1948, and Morrison 1958) have attested in their findings to the salient advantages of such programs over those of the so-called "traditional approach" school, with its main emphasis on translation and on the analysis of grammar. It should be pointed out, however, that those who conducted these studies were comparing the oral ability of children

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<sup>5</sup>Carroll, op. cit., p. 5.

<sup>6</sup>F. M. Hodgson, Learning Modern Languages, Routledge & Kegan Paul, London, 1960., p. 16.

<sup>7</sup>Association of Assistant Mistresses in Secondary Schools, Memorandum on Modern Language Teaching, University of London Press Ltd., Warwick Square London, EC 4., 1956., p. 19.



under the "traditional approach" with oral ability under the new system. Very often the difference in philosophy between the two systems is not taken into account in an appraisal of the findings.

Fewer studies have been concerned with audio-visual second-language programs; and no comparative study seems to have as yet been done on the role played by the visual stimuli of the two programs with which the present study deals. Consequently, this study aims to assess the contributions of these stimuli to the oral performance of pupils who have been audio-visually conditioned by either of the two programs under consideration in the learning of French as a second language.

It should be understood at this point that the distinction made between the terms audio-lingual and audio-visual in this study is a technical one. Essentially, an audio-lingual program stresses listening and speaking as the means of realizing its main objectives. However, it does not preclude the use of visual aids. An audio-visual program, on the other hand, makes use of audio-visual materials, not as aids but as the chief means of developing the listening and speaking skills. The one implies, in the main, the use of ears and the vocal apparatus; the other implies seeing and hearing before attempting to speak.

There are at present, two main types of programs in use in the elementary schools of Alberta - those based on the audio-lingual approach and those based on the use of audio-visual media. The latter, being of more recent vintage and probably because they are more costly, stand in greater need of thorough examination as



regards their efficacy and potential. Corder is concerned "that practically no research has yet been devoted to the important problem of the future, of discovering how best to teach by television: which techniques or teaching methods give the best results."<sup>8</sup> This same concern may be voiced with regard to animated teaching films at the elementary level in the field of second-language learning.

The controversies as to the best method or methods for teaching and learning a second language are many. Some people favor the method of "total immersion", that of having the pupil live and learn in a country where the language is native. The objection to this is its costliness. Others, less ambitious or more practical, opt in favor of the direct method - the almost complete avoidance of the mother tongue, while learning the target language. The chief objection to this method, as Politzer points out, is that it "channels a course into an organization which follows the patterns of the reality around us, the sequence of "events" rather than the structure of the language."<sup>9</sup>

The "linguistic approach", to which others subscribe, makes use, on the contrary, of the construction in the foreign language as the starting point of instruction. This approach differs from that

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<sup>8</sup>Corder, op. cit., p. 236.

<sup>9</sup>Robert L. Politzer, "A 'Linguistic' Teaching Method?" in Readings in Foreign Languages for the Elementary School, Stanley Levenson, William Kendrick, Blaisdell Publishing Company, A Division of Ginn and Company, Waltham, Massachusetts . Toronto . London. 1967., pp. 242-250.





of the direct method in that it employs patterns of increasing structural difficulty in the language. The direct method, on the other hand, allows for a mixture of simple and complex structures in one and the same lesson. Lastly, there are the grammar enthusiasts, who advocate grammatical analysis of the target language as the focal point of instruction.

These controversies have resulted in an indecision as to whether any of the different methods now in use can be considered as ideal. As a consequence of this indecision, research and experimentation must continue at all levels until at least an approximation to an ideal is achieved.

It is to be noted that with the exception of the first method mentioned above, that of "total immersion", all the other methods are classroom oriented, and therefore largely dependent on a teacher-pupil relationship. And therein lies the real problem.

Granted the obvious limitations on second-language learning in the classroom, how can one best develop a sufficient degree of competence in the early stages of second-language learning? What is the best way to build towards real mastery of the target language? A program incorporating visual and audio-lingual devices would seem to offer the most effective solution, since these devices seem best geared to bring the outside world into the classroom, and so, in a sense, simulate the learning situation of the mother tongue.

Statement of the problem. (a) Is the oral performance of





pupils in the target language in any way related to the particular instructional medium by which the pupils have been trained? (b) How well do pupils, trained by either of the two audio-visual programs in French, respond orally to a new situation which is presented by visual stimuli alone?

Significance of the study. This study should help to focus attention on a possibly new and fruitful area in foreign language testing, - that of testing oral proficiency in the target language by the conjunctive use of the language laboratory and various audio-visual devices. It is hoped too, that the results of the study will serve as a guide for the type of visual stimuli best suited to the teaching and testing of a second language at the grade 4 level. Finally the results of the study should give an indication of the expectancy of achievement of pupils taught by an audio-visual method over a stated period of time.

## II. OPERATIONAL DEFINITIONS OF TERMS USED

Animated film. Motion Picture.

Audio-lingual. That which emphasizes the acquisition of listening comprehension and speaking skill.

Audio-lingual Approach of Method. An approach to language teaching that emphasizes the acquisition of listening comprehension and the speaking skill and relies to a large extent on limitation and repetition of limited samples of the language.



Audio-visual. That which deals with listening and seeing and may also have lingual aspects.

Audio-visual program. This refers to a program which attempts to teach a foreign language by means of sound films, television, or filmstrips and tape recorders. It also refers to any program which makes use of a combination of visual and auditory aids alone in the teaching of a second language.

Compound bilingualism. A term used to describe a situation in which a person has not mastered a foreign language to the point where he can communicate in it in any situation independently of his native language.

Comprehension. The demonstrated ability to recognize features that have been presented visually.

Concept. The idea of a class of objects, a general notion, or a portrayal of a sequence of events embodying a single idea.

Contextual Accuracy. The demonstrated ability to recognize an image or idea as fulfilling a particular function within a given context. e.g. La petite fille joue avec la poupée.

Co-ordinate bilingualism. This refers to a situation in which a person is capable of using two different languages independently of each other. It refers, therefore, to the relationship of two language systems in a person who is truly bilingual.

Familiarity. Being conversant with given stimuli or type of stimuli because of repeated exposure to them.

Fixed Film. A filmstrip; non-animated film; sketches



projected on a screen.

FLES. Foreign language in elementary school. The term is used with reference to the special techniques, materials, and problems involved in teaching foreign languages to younger children within stringent limitations of contact time and with few trained teachers.

Image. Sketch or animated portrayal of an object or person, etc., as projected on a screen.

Interpretation. The ability to explain in a specified manner in order to bring out the intended meaning of the visual stimuli.

Medium. This refers to a particular instructional mode, whether it be film or filmstrip.

Structural Accuracy. The correctness of useage of basic structural patterns in French.

Target language. The language being learned as a second language.

Visual Stimuli. This term refers to images projected on a screen and embodying definite concepts. It is also used in reference to the animated or the fixed mode.

### III. ASSUMPTIONS

The objectives of the French programs for Grade Four for all the school systems referred to in this study were assumed to be comparable. These objectives, which were agreed upon by the teachers involved, were: (i) to teach French to pupils in elementary schools, starting at the Grade Four level; (ii) to develop





in the pupils a degree of proficiency in the speaking of French commensurate with the period of time spent in learning the language.

It was assumed that none of the pupils who took the tests spoke French prior to September, 1967; that each testee was exposed to only one type of instructional media during the pre-instructional period from September 1967 to May 1968; and that the content of the teaching programs and the time devoted to instruction in French during the pre-testing stage were comparable for all pupils.

The variable of teacher competence was assumed to be controlled because of the large number of teachers involved. It was also assumed that all teachers followed their respective program guides in instructing their pupils in the French language. The further assumption was made that none of the teachers involved in the project used an instructional method that had not been approved by the investigator.

It was assumed that the directions for administering the tests were faithfully followed by the invigilators, and that the instructions given to the pupils were sufficiently clear as to be fully understood by all pupils. The assumption was also made that the random selection of an equal number of boys and girls for each group adequately controlled for any differences in performance that might have resulted from an uneven distribution of boys and girls in different groups.



Finally, the following assumption was made: that the system of scoring used was sufficiently objective so as not to bias the results of the tests unduly.

#### IV. PURPOSE OF THE STUDY

The purpose of this study is threefold: (1) to compare two different types of visual stimuli that are used in two audio-visual Elementary French Language teaching programs, in order to judge of their effectiveness, wholly or in part, in eliciting oral responses that indicate a degree of proficiency in understanding and interpretation of visual stimuli; (2) to discover how well pupils trained by either of these two audio-visual, second-language programs can utilize orally, in the absence of one or both of the specific teaching conditioners (visual and/or aural), the language being learned. More specifically, how well can the pupils verbalize within contextual situations in the second language, when cued by purely visual stimuli, or by unfamiliar visuals; (3) to find out which of the two types of visual stimuli functions more effectively overall as a testing instrument - film or filmstrip.

In order to evaluate the success with which these three goals have been realized, it is necessary to propose two sets of Null Hypotheses - the one dealing with the effectiveness of the visual stimuli alone in eliciting oral responses indicative of pupils' contextual understanding of the visual stimuli, and with



the relative effectiveness of each mode under testing conditions; the other with the oral proficiency of pupils, trained in part by visual stimulation, to give in the target language responses that are both structurally and contextually accurate.

In order to realize the full purpose of the study, certain other factors that are likely to influence the results are examined in separate hypotheses. They pose the following questions:

- ( i) Does the order of presentation of the visual stimuli affect pupils' performance?
- ( ii) Do conceptual differences affect pupils' performance?
- (iii) Can scores on certain variables be used to predict scores on similar variables that have been treated differently?

The results obtained from an examination of these variables, minor in themselves, should serve to indicate what adjustments or shifts of emphasis, if any, are needed to strengthen the two teaching modes under consideration.

## V. SCOPE OF THE STUDY

This study is largely exploratory, as it is intended as the first part of a more intensive and elaborate investigation into the effectiveness of two types of audio-visual programs in their entirety to prepare pupils to speak a second language with some degree of proficiency. As such, while it takes into account those features that are basic to the programs under study, the testing program concerns itself with only one aspect of the





concerns itself with only one aspect of the programs - the visual. The auditory components of the two programs are, therefore, not examined here.

The study is confined then, (a) to a test of the effectiveness of the testing media, i.e. the visual stimuli of the two instructional modes, to perform as reliable conditioners of oral response in a second language; (b) to an evaluation of pupils' oral proficiency in the target language, when cued by familiar and unfamiliar visual stimuli in the absence of their customary auditory complement; and (c) to an evaluation of the relative effectiveness of each type of visual stimuli as a testing mode.

In view of the stated scope of this study, it must be emphasized that the results here merely serve to indicate the performance to be expected, when verbalization in the target language is dependent upon only one of the conditioning components of the instructional modes - the visual.

## VI. LIMITATIONS

The lack of a testing instrument common to the two programs under study necessitated the preparation of such an instrument. Temporal and financial considerations ruled out the possibility of formally establishing the validity and reliability of the present testing instruments before the actual administration of the tests.

A formal Pilot Study,<sup>10</sup> which was prepared to discover

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<sup>10</sup>See Appendix A.





strength and weaknesses of the proposed testing program, had to be abandoned for lack of available personnel participation and adequate testing facilities. This was also due, in part, to the prohibitive cost of refashioning the testing instruments, in the light of any findings of the Pilot Study. However, the results of an informal Pilot Study justified the use of the instruments as adequate testing instruments.

The variable of intelligence quotient was not considered in this study. It was felt that because of the nature of the samples used as well as that of the testing program, the effects of this variable on performance would have been inconsequential.

## VII. PROCEDURE

In lieu of the formal Pilot Study that was to have been used, an informal "Pilot Study" was carried out by the investigator. Fifty persons (thirty children ranging in age from seven to twelve, and twenty adults) were shown the sketches from which the filmstrips were to be made, as also the photographs taken of the films that were to be used in the tests. The photographs and sketches were then shown to each person, one at a time. Each person was then required to say what was happening in each sketch and photograph, who was speaking, what was the person saying, and the like.

Next, the Ss were asked to look at the photographs, shown in their logical sequences, and the sketches, placed in their logical order, and to tell the story that each such sequence attempted to



tell visually. Briefly, the results of this mini-study showed that twenty seven children and nineteen adults were satisfactorily able to understand the visuals in both media without difficulty when they were presented one at a time. Those who had some difficulty in understanding found that the difficulty disappeared when the visuals were presented in their logical sequence. In a few instances, some adults seemed to see more in the pictures than was intended, but all the children were able, judging from the stories they told, to capture the essential meaning of the visual stimuli with but little variation one from another.

Since the children thus tested were by and large in the same age group as the intended testees, and in four cases even younger (7-8 years old), it was concluded that the visuals were sufficiently discriminating to function reliably for the purpose for which they were conceived. They were therefore used in their original form as the testing instruments for this study.

#### VIII. NULL HYPOTHESES

In order to answer the questions implicit and expressed in Chapter I, pp. 11 and 12, the following null hypotheses were formulated:

1. The type of visual stimuli presented (fixed or animated) does not significantly affect pupils' scores on (a) comprehension, (b) interpretation, (c) structural and contextual accuracy, (d) overall.



2. Familiarity with a given type of visual stimuli does not significantly affect pupils' scores on (a) comprehension, (b) interpretation, (c) structural and contextual accuracy, (d) overall.

3. The order of presentation of the visual stimuli (fixed or animated) does not significantly affect pupils' scores on (a) comprehension, (b) interpretation, (c) structural and contextual accuracy, (d) overall.

4. There is no significant difference between scores on concept 1 and concept 2<sup>11</sup> on either of the variables - comprehension, interpretation - in either the fixed or the animated medium.

5. The comprehension and interpretation scores on a given concept viewed segmentally in either medium cannot significantly predict the comprehension and interpretation scores on that concept viewed as a whole in either medium.

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<sup>11</sup>For a description of concepts 1 and 2, see Appendix B.



## CHAPTER II

### A REVIEW OF THE LITERATURE

The increasing awareness of the necessity to appraise and justify their professional task by those whose métier is the teaching of foreign languages in a world whose communicative barriers contract almost daily may well have been a factor in the development of FLES. Foreign languages in the Elementary Schools - FLES -, is in the terms of Nelson Brooks, "a postwar phenomenon of country-wide proportions, whose existence was officially recognized in 1952 by the Office of Education in Washington, D.C., and by the Modern Language Association in New York."<sup>1</sup>

Since that time, the movement has spread throughout North America and Canada. Brooks goes on to explain that FLES is based on "the supreme psychological fact" that any child can learn any language merely by exposure to the "language in action" of those about him. However, the difficult problem of finding a sufficient number of suitable and competent teachers as well as effective teaching methods to substantiate this "fact" has not been entirely overcome.

Pillet reported the results of a pilot program (1959-1960) and its continuation (1961-1962), in which it was found that the

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<sup>1</sup>Brooks, Nelson, "The meaning of FLES," Teacher Education Quarterly, 41., 1958., pp. 27-29.





use of slides and tapes was a useful means of overcoming teacher shortage, while at the same time affording pupils a satisfactory introduction to correct French pronunciation as well as to some acquaintance with the French language.<sup>2</sup>

However, a great deal of methodological experimentation is still in progress in an attempt to discover a method or methods that will be ideally suited to the objectives of the FLES movement. It will be remembered that mention was made in Chapter 1 of the variety of methods being used in the teaching of foreign languages. The present emphasis, it was noted, is on audio-lingual and audio-visual teaching programs. This is especially true of FLES programs.

It is also true that in its earlier stages the FLES movement depended largely on the audio-lingual approach, since that seemed to be the best current system at the time. With the introduction of acceptable and sometimes sophisticated audio-visual teaching programs in the late fifties, some teachers continued with audio-lingual programs, while others made use of the newer audio-visual programs or some combination of the two.

Audio-visual programs have yet to prove their full worth as regards the attainment of the objectives they have set in comparison

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<sup>2</sup>Roger Pillet, "French with Slides and Tapes - A Reappraisal", Elementary School Journal, 65, November, 1964., pp. 87-91.



with more established modern language teaching programs.

There are, basically, three main vehicles of audio-visual second language teaching programs - television, moving pictures, and filmstrips with accompanying tape-recorded voices. Television, because of its ability to make use of techniques common to both films and filmstrips, seems to be the most versatile of the three for teaching purposes. The advantage of the film seems to lie in its ability to emphasize those features with movement and real life situations without much ambiguity. The filmstrip has in its favor the fact that its significant and meaningful features can be better organized to convey just what the author wishes to emphasize at any given moment. In addition, a longer time can be spent in contemplating visually what has been presented than is the case with either films or television.

However, since this study deals specifically with a comparison of the effectiveness of two named types of visual stimuli - fixed and animated films, - the literature reviewed will deal principally with studies which relate or can be related to those stimuli. In fact, the nature of the literature to be reviewed is such that the studies dealing with each type of visual stimuli have had to be reviewed separately.

The present study seems to be the first of its kind to attempt a direct comparison of the two visual media examined here in the testing of foreign language achievement. A careful search of the relevant literature failed to produce any similar studies.



Consequently, no directly comparable studies can be reviewed.

The review of literature which follows is divided into four sections. Section I attempts succinctly to place in perspective the literature which deals with the present status of research on audio-visual, second-language teaching programs. Section II provides a brief historical background on the use of visual aids as well as a review of the literature on related theories and studies dealing with audio-visual aids. The third section reviews related research on film and television programs. Finally, section IV presents a review of related research on filmstrip programs.

#### I. THE LITERATURE IN PERSPECTIVE

Although much research has been done on the use and the effectiveness of visuals in education generally, foreign language research in this respect has been negligible. There is undoubtedly no dearth of materials and techniques on which to base such research. There seems to be, however, a lack of adequate financial support and an acute shortage of researchers to undertake such projects.

Travers,<sup>3</sup> speaking of the study of curriculum problems in general, has drawn attention to the fact that enough has been accomplished in the development of techniques of content analysis

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<sup>3</sup>Robert M. W. Travers, An Introduction to Educational Research. Second Edition. The MacMillan Company, New York, Collier-MacMillan Limited, London, Second Printing, 1964., pp. 63-64.





to inspire research workers to apply such techniques to the study of curriculum problems. He makes it clear, nonetheless, that techniques for measuring the important characteristics of other curriculum materials such as visual aids have been much less well developed. As it applies to audio-visual second-language programs, this last statement is only partially true. The MLA Cooperative Foreign Language Tests (1964), and Pimsleur's French Speaking Proficiency Test, French Review, 1961, 34, 470-479, are but a few of available tests which suggest possibilities for the effective measurement of foreign language learning that has been visually or audio-visually conditioned. The problem is that they have not been adapted for use with elementary school children.

However, the findings of research on audio-visual teaching and testing techniques have not always been sufficiently conclusive to sustain any serious credulity of their intrinsic worth. Levenson, speaking of the use of television, and therefore by implication, of motion pictures, states that: "research has not yet indicated that children listen, speak, read and write any faster by staring at a lighted screen."<sup>4</sup>

With less acerbity, but in a tone of implicit despair, Carroll notes that:

"As in other areas of educational research, it is difficult to find anything but speculative and descriptive writings concerning the proper organization and format of

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<sup>4</sup>Stanley Levenson, "FLES is a revolution!" California Teachers Association Journal, Vol. 59, No. 4 Oct., 1963, pp. 63-64.





foreign language reading materials, textbooks, and films. The literature does not even seem to contain surveys of the opinions and the preferences of the teachers and students about such materials."<sup>5</sup>

Relatively few experimental studies have been done on audio-visual second-language programs since the writing of the above-mentioned citations. Most of the literature continues to be in the area of speculations and generalizations. Added to this, the experimental studies that have actually been done very rarely attempt to examine the effectiveness of audio-visual, second-language programs per se. Instead, programs in the media are usually being tested for their relative efficiency in comparison with a conventional second-language program.

The related literature of the present study must, therefore, be understood against the background presented in this section. It should, however, in all fairness to other researchers in the field, be mentioned that formal experimentation and evaluation of audio-visual programs is a very costly undertaking. This no doubt accounts for the paucity of studies in the field. Everyone is well aware of the need for research in the area, but few have or can afford the means to undertake such research.

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<sup>5</sup> John B. Carroll, "Research on Teaching Foreign Languages," from Handbook of Research on Teaching, pp. 1060-1100. Chicago: Rand McNally, 1963.



## II. RELATED STUDIES AND THEORIES ON THE USE OF AUDIO-VISUAL AIDS

For a long time teachers have realized the value of aids - audial and visual - in the teaching and learning of a foreign language. Comenius, the famous seventeenth century educator, made use of pictures to illustrate the meaning of terms he used in his Latin Glossary. He postulated in his Orbis Pictus (The World of Pictures) that: "Nihil est in intellectu quod non prius fuerit in sensu." (Understanding presupposes a sensory existence), or, more literally translated 'Nothing exists in the understanding that has not previously existed in the senses.'\* Comenius felt that following a use of these aids the meaning of the terms would be more readily understood.

In the nineteenth century François Gouin advocated the "psychological" approach to the learning of foreign languages. This approach was based on the principle of the association-of-ideas and its corollary "mental visualization". Gouin employed as necessary adjuncts to the language learning process diagrams, pictures, charts, objects, and pantomime.

Teachers of the present generation continue to make use of such aids as an integral part of their teaching programs. They have recognized, too, the importance of varying the aids and their use for maximum effect. These aids become particularly helpful in

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\*The translations are those of the writer of this study.



teaching elementary school children, for as Babcock and Kwapil point out:

"The pupil is introduced to new vocabulary by the teacher who demonstrates the object or picture as he drills on the term. Still manipulating the object, he involves the children in the use of the new expression through questions and answers using otherwise familiar vocabulary."<sup>6</sup>

This method of teaching is analogous to the basic idea of the animated and fixed film second-language programs compared in the present study. The pupil is introduced to new vocabulary through the images represented on the screen. These images are perceived visually, and their new "referents" are enforced auditorily. Subsequently, this audio-visual conditioning, if repeated often enough, reinforces the material to be learned, along with the necessary post-viewing follow up practice by the teacher. Full comprehension of the foreign terms taught in this manner may thus be ensured. In fact, this approach to the teaching and learning of a second language is the quintessence of the beginnings of co-ordinate bilingualism. It forces the learner to associate the images with the new sounds only; and hopefully, with the new meanings attached to the audio-visual conditioners. The use of the learner's native tongue is thus effectively curbed.

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<sup>6</sup>Chester D. Babcock & Helen M. Kwapil, "Audio-visual Aids in Teaching Foreign Languages," National Elementary Principal Vol. XXXIX, No. 6, pp. 16-19, May, 1960.





Carroll<sup>7</sup> is of the opinion that in the teaching of the language arts, especially in the primary and elementary grades, the school can foster the cognitive development of the child best when it takes into account the large variety of concepts the child brings to his school years. He suggests that this be done by a process of giving as many pertinent experiences as possible and establishing learning conditions which will allow the child to see relevant distinctions in meaning and differential classification of concepts. This suggestion seems most applicable to the possibilities it implies for the use of audio-visual aids in second-language teaching programs.

The Memorandum on Modern Language Teaching emphasizes that:

"As the modern child is surrounded by visual aids, it is most important that the teacher of Modern Languages should incorporate these aids into her teaching."<sup>8</sup>

It further points out that "there is certainly no lack of aural aids to help the enthusiastic Modern Language teacher both in and out of school."<sup>9</sup> A long list of suggestions is given as to available aids, visual and aural: - silent films, filmstrips and television; tape recorder, sound films, gramophones, radios and the

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<sup>7</sup> John B. Carroll, Language Development in Children, in Psycholinguistics, a book of Readings (Ed. Sol Saporta) Indiana University. Holt, Rinehart and Winston, New York. Chicago . San Francisco . Toronto . London., 1961., p. 342.

<sup>8</sup> Association of Assistant Mistresses in Secondary Schools, Memorandum on Modern Language Teaching, University of London Press, Ltd., Warwick Square London EC 4, 1956., p. 60.

<sup>9</sup> Ibid., p. 60.





like.

Support for these suggestions is widespread among teachers of foreign languages throughout the world, and assistance as to how to make use of them is given in helpful hints in most books and textbooks which deal comprehensively with the teaching and learning of foreign languages.

Among such textbooks are those of:

Eaton, Hayes, and Norton,<sup>10</sup> Huebener,<sup>11</sup> Glaude<sup>12</sup> and Finocchiaro,<sup>13</sup>

Working in an area more closely related to the present study, Kale and Grosslight<sup>14</sup> in 1955 studied the use of pictures and sound in the teaching of foreign language vocabulary. The experiment involved the writing by the pupil of a Russian word in

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<sup>10</sup>E. Eaton, M. Hayes, and L. Norton, Source materials for Secondary School Teachers of Foreign Languages, U.S. Department of Health, Education, and Welfare, Washington, D.C., OE 27001B, 1962.

<sup>11</sup>Theodore Huebener, Audio-Visual Techniques in Teaching Foreign Languages, New York University Press, 1960.

<sup>12</sup>Paul M. Glaude, Selective Guide to the Acquisition of Audio-Lingual and Related Materials Useful in Teaching Modern Foreign Languages in the "New Key," Chilton Company, Philadelphia, 1961.

<sup>13</sup>Mary Finocchiaro, Teaching Children Foreign Languages, McGraw-Hill Book Company, New York . San Francisco . Toronto . London., 1964.

<sup>14</sup>S. V. Kale and J. H. Grosslight, Exploratory Studies in the use of Pictures and Sound for Teaching Foreign Language Vocabulary. Tech. Rep. SDC 269-7-53. Port Washington, New York.: U.S. Navy Special Devices Center, 1955, Foreword.



response to an English word, a picture or a word-picture combination. The material was presented by still picture versus motion picture (one of the variables studied). The Russian word was said by a narrator on the sound film, with or without student "participation". The investigators concluded, in part, that "Pictures of an object or an act are an aid to learning to write foreign words ... The pictures need not be in motion ... Pronunciation of the [i.e. Russian] words by the narrator or learner seems to inhibit learning foreign words."<sup>15</sup>

These findings are in accord with the general conclusion reached by Carroll<sup>16</sup> after his review of those studies which treated the same problem as did Kale and Grosslight. Carroll was concerned with discovering whether foreign language words should be conveyed by pairing them with glosses in the learner's native language, or with pictures of, or actual pointings to objects and movements. He noted that most of the evidence favored pairing with pictures and the like. Among the studies he cites in order to justify his assertion are those of: Braunschauen (1910), Kopstein and Roshal (1954), Netschajeff (1910-1911), Peterson (1903), and Schlüter (1914). The titles of these studies<sup>17</sup> give

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<sup>15</sup> Ibid., Foreword.

<sup>16</sup> John B. Carroll, Handbook of Research on Teaching, pp. 1060-1100. Chicago: Rand McNally, 1963.

<sup>17</sup> See Bibliography.



a clear indication as to their relationship to the Kale and Gross-light. Finally, Carroll, following a review of the studies cited, expounds as follows:

"Nevertheless, a generalization directly applicable to foreign language teaching seems fairly well established: foreign words are best learned (and probably better retained) when presented in association with the objects, actions, qualities and conditions which are their referents.<sup>19</sup>

This brief expose gives some insight into the possibilities of the use of aural and visual aids (separately, and combined) in the teaching of foreign languages. Moreover, the literature reviewed in this section points to the direction in which the use of these aids should be developed. It does this by disclosing the inherent potentials of audio-visual programs as being most promising as regards the development and fostering of co-ordinate bilingualism in young children. However, since the effectiveness of the aids depends, in the words of Frances Creore,<sup>20</sup> on their "wise use", cautious and constructive use is advised. Finally, the literature reviewed suggests that the optimism shown in the increasing use of aural and visual aids in second-language teaching may be well-founded.

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<sup>19</sup> John B. Carroll, Research on Teaching Foreign Languages, College of Literature, Science, and the Arts. The University of Michigan, Ann Arbor, Michigan, 1961., p. 25.

<sup>20</sup> Frances B. Creore, "The New media in Language Teaching," Audio-Visual Instruction, 5., November, 1960, pp. 286-293.





### III. RELATED RESEARCH ON FILM AND TELEVISION PROGRAMS

The first two studies included here are intended as a necessary prologue for the fuller appreciation of the review of related research which follows. From the evidence presented by Reid and MacLennan, the research trend since 1954 has been devoted more to televised than to filmed instruction. The consequence of this is that only "a relatively small number of studies has been concerned with comparisons of learning from filmed courses..."<sup>21</sup> Fewer still are concerned with filmed second-language courses; and none seems to have compared any two filmed second-language programs.

Reid and MacLennan pointed out that some film studies have actually used kinescope recordings produced from television programs, a fact which made it difficult for them to decide whether a specific study was television research or film research.

The review of literature which follows in this section considers research on filmed as well as televised instruction. This is deemed to be desirable for three reasons. Firstly, for the reasons advanced above by Reid and MacLennan; secondly, because the nature of the films and filmstrips used as testing instruments in this study are such that they could have been





utilized similarly on television with but little variation in mode of presentation. Thirdly, it is felt that the findings of research on televised instruction in foreign languages can, in many instances, be successfully extended to include filmed instruction in a foreign language.

Previtali has this to say about the use of motion pictures in the teaching of foreign languages:

"The film industry has at its command the near-perfect reproduction of sight and sound from the grandiose to the minute as well as the representation of human actions and emotions from the simplest to the most subtle."<sup>22</sup>

He draws attention to the countless numbers of non English speaking peoples, who have learned to speak fluent English merely by 'going to American movies.' Previtali goes on to explain the secret of how motion pictures can teach a foreign language by comparing it with how a child learns to speak. What happens, he says, "is that the child fixes his attention on an object and receives a visual impression of it, while at the same time he hears his mother say the word for that object." Subsequently the child receives a second impression, which is an audial experience and he associates the two in his mind (the visual and the audial). When the image is later on recalled, the child remembers the sound that went with it, and usually he will say it. The analogy is very clear and seems a sound working theory.

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<sup>22</sup>Giovanni Previtali, "Foreign Languages by Motion Pictures," Modern Language Journal, 44, 1960, pp. 171-176.



This idea that a second language may be best learned by associating visual impressions with their corresponding auditory impressions is, in a sense, factually supported by the findings of a study reported by Hayman.<sup>23</sup> Twenty four classes, comprising five hundred and seventy seven pupils were chosen at random from among fourth graders in the Denver public schools. These children were taught Spanish from the outset. The purpose of the investigation was to teach in Spanish three fifteen minute lessons by television, and subsequently to test what was taught. These lessons dealt specifically with articles of clothing, and were video-taped for the study. Lessons were telecast on open circuit TV on three consecutive days, and the subjects saw them in their regular classroom with their regular teacher in attendance.

Pupil location in relation to the television set was one of the variables studied. Approximately half of the pupils sat in the center, one-third at the sides and one-sixth at the back of the classroom. Two distinct aspects constituted the learning task of the study - (1) understanding of spoken Spanish, and (2) pronunciation of Spanish words. It was hypothesized that visual acuity was almost certainly more important to the speaking skill than to the understanding skill. It was further hypothesized that if the importance of location is a function of required visual acuity, as other research suggests, viewer location should affect

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<sup>23</sup> John L. Hayman Jr., "Viewer Location and Learning in Instructional Television," Audio-Visual Communication Review 11, May - June, 1963, pp. 27-31.



speaking more than understanding.

The findings indicated no significant difference between either of the groups on listening comprehension, which measured ability to understand spoken Spanish. In the speaking test, both pupils in the center and at the back performed significantly better than those at the side; and there was no significant difference between the center groups and the back groups. It was concluded that the effect on learning of viewer location relative to the TV screen depends on the nature of the learning task. A further conclusion, which may have influenced the oral performance scores of testees in the present study, was that the differences in speaking scores were due to the fact that visual perception was of much greater importance in the development of the pronunciation skill, since pupils had to see clearly and accurately the lip and tongue movements of the instructor.

Two studies, dealing with areas outside of second-language learning and testing, found that in using instructional films position relative to the screen did affect learning, if extreme demands were made on visual acuity, (Ash and Jaspen, 1953; Gibson, 1947). This variable was not considered in the present study, although in the light of these findings it could very well have been one of the contributing factors to the performance of some of the testees insofar as comprehension and interpretation of some of the visual stimuli were concerned.





A study carried out by the Toronto Board of Education<sup>24</sup> had two interesting conclusions that point out two possible areas of weakness in foreign language films used for teaching or testing. These are: (i) lengthiness of the films could be an adverse factor in learning; (ii) there is the tendency in some films to introduce new material too rapidly. These disadvantages were obviated in the present study by (i) the preparation of short, single concept films; (2) by the use of graded materials of the work that had been covered and that were common to the program on which the tests were based.

Najem describes a comparative study which was tantamount to a test of achievement in French. The experimental group had a correspondence type course and an extra one hour weekly of televised French, while the control group learned French and other languages through a correspondence course. On evaluation at the end of the experimental session, September to May, it was found that the experimental group had better grades, was superior in classroom performance and in oral proficiency over the control group; and that motivation in the experimental group remained constant throughout the semester.<sup>25</sup>

Bundy reported similar findings in his study favoring the

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<sup>24</sup>Toronto Board of Education, Experimental Study of Learning French in the Public Schools, undertaken by the Toronto Board of Education, Report No. 1., 1959-1960, Toronto, Canada: Author, 1960.

<sup>25</sup>Robert Najem, "The Wasau Story in Educational Television," Modern Language Journal, May, 1965., pp. 313-315.





effectiveness of television teaching over that of regular classroom procedures. In his study, he compared the effectiveness of television presentation with classroom procedures in the teaching of Spanish verb forms.<sup>26</sup>

The problem posed in another study has real implications for the teaching and testing of a second language by means of films as well as television. The purpose of the study was to find out how much a second viewing of a television lesson increased learning. This study, part of the Denver Stanford Project, was concerned with the teaching of Spanish to fifth and sixth graders in the Denver Public Schools. Its basic instructional medium was a fifteen minute open-circuit telecast viewed during regular school hours. The investigators sought answers for the following questions: (1) To what extent do the instructional film results concerning exact repetition generalize to television; and (2) with variations in presentation of lesson content possible in the school, is exact repetition still valuable?

Three basic research groups distinguished by activities in addition to the in-school TV lesson comprised the research sample. Group 1 (control) had no additional activity. Group 2 had a second viewing of the TV lesson at home; and Group 3 had a fifteen minute teacher-directed follow-up after each in-school TV viewing. This comprised the work of the first semester. In the second semester, single viewing only was discontinued, the two remaining single practices from the first semester

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<sup>26</sup>Edward Wayne Bundy, "Television and the Learning of Spanish Verbs," The Impact of Educational Television, Urbana, Illinois., University of Illinois Press, 1960., pp. 125-142.



being maintained. In addition, a new group had both in-school teacher-directed practice and a second viewing in the evening (1960-1961).

In 1961-1962, all pupils had teacher-directed classroom practice and, again, some viewed the evening telecast and some did not. Conditions were constant for both the first and second semesters. The findings indicated that exact repetition significantly increased learning when there was no other practice. It was not, however, as effective as teacher-directed classroom practice and its ability to increase learning when added to classroom practice varied inversely with the training and experience of the classroom teacher.

The conclusion was that exact repetition in Educational Television is a potent variable, but not as potent as a skillfully presented varied repetition. Not all variations are better than exact repetition, and for each particular set of circumstances, effective variations must be determined through research.<sup>27</sup>

Margaret Zimmerman<sup>28</sup> reported on an experiment in which films were used to teach French. Emphasis was on conversation exclusively, with no formal grammar. She found that when the pupils were tested, they did well in comparison with other pupils

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<sup>27</sup> John L. Hayman Jr., and James T. Johnson Jr., "Exact versus Varied Repetition in Educational Television," Audio-Visual Communication Review, 11, No. 4., July-August, 1963, pp. 96-103.

<sup>28</sup> Margaret K. Zimmerman, "Les films apportent un peu de France à Euclid," in Ohio Schools, 43, 1965, pp. 20-21, 37, 40-43.



in the project. Moreover, she found that the pupils did better on conversational French than any other previous set of pupils in that school had ever done. These same pupils also did well in tests of other language skills, and the writer concluded in these words:

"Even those of my students who are unwilling or unable to master writing French can understand and communicate about an amazing number of subjects and have little difficulty in reading. I can't say this about any other approach to French that I know about."<sup>29</sup>

The genuine satisfaction expressed here about the Rosselot film method, used by Zimmerman, should help to dispel any doubts one may have had about the potentials of second-language film programs.

The last study to be reviewed in this section is probably the most valuable, in recent years, on the use of second-language films. Reference is here made to the study of Victor Ferenczi,<sup>30</sup> "La perception de l'espace projectif", a study undertaken on illiterate African workers in France. Briefly, Ferenczi attempted to find out how effective films can be in teaching a foreign language (with its cultural implications) to illiterate foreigners. Age in terms of educability rather than aptitude, and level of literacy were among the chief variables studied. The key questions of the study were: (1) What is the formative value of literacy, and (2) how significant is the part played in the cinematographic perception of projective space by fundamental educational skills, i.e.,

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<sup>29</sup>Ibid., p. 43.

<sup>30</sup>Victor Ferenczi, La Perception de l'espace projectif, étude réalisée auprès des travailleurs Africains analphabètes en France., Didier, Montréal, Paris, Burxelles., 1966.







the degree of mastery of reading and writing?

It was found that level of literacy affected one's degree of perception, especially of objects of more than one dimension. It was also found that films were interpreted in terms of the subjects' cultural conditioning (social and educational). Hence, literate pupils were better able to detect a graphic code which demanded perceptive discrimination and identification of the semantic value of such a code, than were illiterate laborers.

From his findings the investigator concluded, in part, that: perception is culturally conditioned; the preparation of instructional films ought to be such that they can be based on a psychology of perception and learning; graphic reproduction of empirical data is not an imitation of reality but always supposes a mental reconstruction of life; the cinema has the advantage of being able to make itself intelligible even when it is conceived without sound. He further concluded that, for an enlightened public, the cinema appears to be an efficient communicative aid, whereas for an uninformed audience there intervenes an ethno-cultural factor, which transforms this crutch into an obstacle (p. 138). Lastly, the cinema is seen as fulfilling a privileged role in cutting across the cultural barriers of perception, by providing perceptive initiation (*préformation*) in a foreign culture to illiterates, who need to profit from audio-visual instruction or to use such aids towards the attainment of professional and educational ends.<sup>31</sup>

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<sup>31</sup>Victor Ferenczi, op. cit.



Judging from the studies reviewed here, it is evident that sufficient research has been done on what may be termed the "priority considerations" of second-language film and television programs. These include studies on the relative effectiveness of filmed, television and kinescope courses with direct instruction, studies of the application of films for foreign language instruction, and studies of the effects of production variables in films.

These studies have not, however, been too productive of ideas as to how to improve the effectiveness of these audio-visual media. Neither have they attempted the comparison of different types of audio-visual programs to see which may be the most effective in second-language teaching and testing. Such comparisons are badly needed. It is to the partial initiation of this task that the present study is directed.

#### IV. RELATED RESEARCH ON FILMSTRIP PROGRAMS

Huebener lists the following advantages of the filmstrip over ordinary film and even over motion picture:

"The filmstrip

- (1) Retains unity.
- (2) Is enriched and clarified by accompanying comments and discussion.
- (3) Can be moved forward or backward with ease.
- (4) Is simple to operate.
- (5) Is economical.
- (6) Is easy to handle."<sup>32</sup>

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<sup>32</sup>Theodore Huebener, Audio-Visual Techniques in Teaching Foreign Languages, New York University Press, 1960., p. 45.



Assertions of this kind, although tenable, lay themselves open, because of their lack of proven statistical validity and empirical justification, to the charge of limited vindicability. Theoretically, Huebener's assertion seems to be sound; and it undoubtedly provides a challenging research proposition to substantiate or repudiate it. However, based as it seems to be on common sense, coupled with careful observation and years of experience, the justification of the claims must be accepted until research proves otherwise. Huebener's list of advantages certainly emphasizes the need for studies that will compare experimentally the media of which he speaks, insofar as concerns foreign language teaching and testing.

In 1948, Naida Dostal carried out a study on the use of filmstrip in six Detroit High Schools. The object was to compare the traditional approach to foreign language study with an integrated audio-visual approach in order to see which instructional materials and teaching techniques, audio-visual or standard, resulted in greater achievement in understanding, speaking, reading, and writing at the end of the first year. A summary of the findings shows the control group to be better in reading at the .05 level of significance after one semester, and at the .01 level in speaking from beginning to end of the first year of study. No significant differences were noted with regard to the abilities of the two groups to understand French.

Dostal blamed some of the weaknesses of her study on the





absence of standardized tests at that time to measure aural comprehension and oral production in Elementary French at the High School level. A third possible area of weakness, she felt, was that the teacher variable was not adequately controlled.<sup>33</sup>

Chronologically, the next study was done by Richardson. This study was conducted in a provincial High School. Two groups of children of roughly the same age, ability and achievement were used. The control group was made to learn by an active oral method. The experimental group learned free composition and concrete vocabulary by means of filmstrip visuals. The results showed that the filmstrip visual method was superior insofar as the specific learning desired had been made the subject of a given frame. No significant difference was noticed in respect of auditory comprehension of spoken or written French. The investigator pointed out that there was evidence to suggest that the less intelligent pupils profited most from the filmstrip method. Some of the weaknesses of the study were reported to be in the small number of the groups tested and in the several uncontrolled variables such as the use of different teachers between methods, different testing instruments being used for the resultant data, and approaches too dependent on teacher originality.<sup>34</sup> In the

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<sup>33</sup> Naida M. Dostal, "A Comparative Evaluation of the Use of Audio-Visual Instructional Materials and Teaching Techniques in First Year High School French," (unpublished doctoral dissertation, Wayne State University, Detroit, Michigan, 1948), pp. 116-117.

<sup>34</sup> G. Richardson, "An experiment in the Use of Filmstrip in the Teaching of French," Durham Research Review, 2: September, 1957, pp. 142-150.





present study the testing instruments were equated and the number of pupils used in each group was sufficient to ensure results that are statistically significant.

Borglum reported a study done on a beginners' French Course at Wayne State University. He and McPherson took some colored slides in France and used these to develop the course mentioned. These slides were used over a number of years in the classroom; and, from their findings, the investigators concluded that "much greater language learning achievement resulted from the instruction having been keyed to visual experience."<sup>35</sup>

According to the investigators, the audio-visual approach consisted of a three-dimensional experience having: (1) literal meaning which enabled students to get the meaning from the visual image without recourse to English as an intermediary; (2) cultural significance which made it possible for the student to learn the concept which the picture intended to illustrate in its appropriate milieu; (3) psychological values which gave the viewer an inescapable urge to identify himself with what he saw.<sup>36</sup>

In other studies using the visual approach, Borglum and McPherson (1959) described their rationale as being "language as behavior," to build a background of experience from which one might exploit to advantage the students' natural urge to communicate. The results of their studies indicate that, at the end of

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<sup>35</sup>George P. Borglum, "AV Active French," National Education Association Journal, 47, November, 1958, pp. 566-568.

<sup>36</sup>Ibid., pp. 566-568.



the first year, the speaking ability of the color slides groups was 50% better than the speaking ability of groups taught in the conventional manner.<sup>37</sup>

Another study which showed results favorable to the use of filmstrip visuals is that of Clarence Wachner.<sup>38</sup> Here, an experiment was carried out with an integrated audio-visual French Program in three High Schools in Detroit. The findings showed that the audio-visual approach did an effective job "with less student mortality and with greater pleasure to all participants concerned." The writer concluded that the audio-visual approach could be of great value in implementing the direct method, and in doing away with vocabulary thumbing, and as a means of training the pupil to think directly in the foreign language.

Wachner's conclusion with regard to pupils thinking directly in the foreign language is supported by the findings of the present study. It was observed that the pupils of the experimental groups (audio-visually trained) had less of a tendency to respond in English, when they were required to speak French, than did the members of the control groups. These latter were not trained by an audio-visual program.

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<sup>37</sup>George P. Borglum, and James J. McPherson, "The Visual in Audio-Visual Language Teaching," French Review, 33, October, 1959, pp. 53-58.

<sup>38</sup>Clarence Wachner, "Emphasis on Cultural Content and Conversational Fluency: Audio-Visual Instruction," Modern Foreign Languages in the High School (Washington: Govt. Printing Office, 1958), pp. 73-78.



Using the Images de France materials developed by Borglum and McPherson, a controlled experiment was done by Creore and Hanzeli<sup>39</sup> to determine the extent of difference in achievement between integrated audio-visual materials and the conventional, non-visual textbook approach to the teaching of French. From the findings of this study, it was concluded that the experimental (visual) method demonstrated a high superiority in its efficiency of teaching the speaking skill. Of particular interest was the fact that in spoken French the pronunciation of the experimental students was better than that of the control students. However, the control group was superior in the reading and writing skills, although it showed itself to be at a motivational disadvantage when compared with the experimental group.

Mialaret and Malandain<sup>40</sup> initiated an investigation which aimed to study the reactions of children to a fixed silent film, and to analyze the difficulties encountered by the pupils in the interpretation of the graphic language utilized therein. The study was psychological in its perspective. Two hundred and twelve children, boys and girls, from primary schools were chosen

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<sup>39</sup>A. E. Creore, and Victor E. Hanzeli, A Comparative Evaluation of Two Modern Methods for Teaching a Spoken Language, Final Report submitted to the United States Office of Education, Grant No. 745016-09, Seattle: Department of Romance Languages and Literature, University of Washington, 1960.

<sup>40</sup>G. Mialaret, C. Malandain, "La perception du film fixe chez l'enfant," in Études de Linguistique Appliquée, Faculté des Lettres et des Sciences Humaines, Université de Besançon, Didier, Paris, 1962., pp. 95-103.







randomly from the town of Saint Cloud, as follows:

Les cours élémentaires (1st year - children 7-8), (2nd year - children 8-9).

Les cours moyens (1st year - children 9-10), (2nd year - children 10-11).

The films used in the study were taken from the series Voix et Images de France, lesson 24, which is designed primarily for the teaching of French to adult foreigners. The experiment was conducted as follows:

The children were questioned individually. Each child saw only one of the three stories of the film. The film was then presented twice, as a whole, without sound, and the pupil was required to give an account of what he saw. Next, the film was presented frame by frame, and the child had to give a commentary on each frame. Answers to both sections of the test were then transcribed by the investigators. It is to be noted that the children were seeing the visual material for the first time, and were deprived of any auditory assistance.

Briefly, the investigators distinguished four stages in the evolution of perception; and found that in reality this evolution was not discontinuous from one course to another. The study revealed that in stage three (ages 9-10) the child is only capable of interpreting one 'image' at a time, and begins to establish a logical link between 'images'. The possibility of synthesis is still fragile and the errors (misinterpretations and incomprehension) are numerous. In stage four (ages 10-11),



the child, it was found, is capable of making a correct synthesis of a film and his perception approaches adult norms. At this stage too, the psychological evolution of the child, it was found, has attained a level where one may envisage with absolute security the utilization of the fixed film.<sup>41</sup> The investigators also found that certain pictures elicited identical responses from children, while others elicited original interpretations that were essentially different one from the other. The same trend was noted among testees of the present study.

In another study Guén<sup>o</sup>t et al. focussed their attention on the problems of the evolution of the aptitude of subjects to read still sketches, and on the introduction of the readability of the still sketches themselves. The aim of the study, according to the authors, was to isolate and bring into focus certain psychological phenomena rather than to give definitive results.<sup>42</sup> The material used in the test was prepared by the CREDIF 3 team, and comprised sketches projected on a screen, with sound synchronization from a magnetic tape. Forty audio-visual lessons intended for the learning of English by adults were used. These consisted of narrative dialogues, each of which demonstrated one or more

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<sup>41</sup>Ibid., pp. 95-103.

<sup>42</sup>J. Guén<sup>o</sup>t, C. Sturge-Moore, M. Tardy, "Études sur l'évolution de l'aptitude des sujets à lire les vues fixes et introduction à une méthode sur la lisibilité des vues fixes à propos d'une méthode d'apprentissage de l'anglais à des débutants adultes," in Etudes de Linguistique Appliquée, Faculté des Lettres et des Sciences Humaines, Université de Besançon, Didier, Paris 1962., pp. 104-136.



points of grammar. Lessons were given audio-phonetically in English and the pictures were shown while the students listened to the tapes. During the spoken section of the text, which is taped without sound blanks, the students looked and listened. Then during the sound blanks, the teacher made one or two students repeat the sentence. Two groups were taught, neither exceeding twelve students.

After a few attempts, the investigators abandoned the first project entitled "Study of the readability of fixed films" (still sketches) because they felt it was not "hemming in" (ne cernait pas) "reality with sufficient precision." This first project was therefore completed by a second, entitled "Study of the aptitude of subjects to read still sketches." Neither study was completed in its entirety; but the authors were able, nonetheless, to draw some conclusions from their findings. They concluded that "there is a phenomenon of progress in the ability of subjects to read images after an initial period of helplessness and clumsiness, and that the pedagogical procedure which consists of having students look at the images of the filmstrips and find their meaning as a group, at the end of the session which precedes their utilization, can only be generalized."<sup>43</sup>

Alhinc et al<sup>44</sup> undertook in their study to bring about the

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<sup>43</sup>Guénot et al., op. cit., pp. 104-136,

<sup>44</sup>M. Clay Alhinc, P. Léon, "Laboratoire de langue et classes audio-visuelles," in Études de Linguistique Appliquée, Faculté des Lettres et des Sciences Humaines, Université de Besançon, Didier, Paris 1962., pp. 156-167.





rapid acquisition of spoken English among adult beginners by using both the Language Laboratory and audio-visual materials in roughly equal proportions. Audio-visual materials meant for this study films and filmstrips as well as the extra visual support of phonetic transcription. Thirteen subjects were used. When these were tested at the end of six weeks of instruction, it was found that two students were considered poor, four average, two very good, and five excellent. "Excellent" implied that the students were capable of sustaining a conversation in ordinary English with a limited vocabulary of about one thousand, five hundred words and were able to use and understand, almost perfectly, everyday structures of spoken English. The conclusion reached by the authors was that a great deal more had to be done to improve the method. However, the positive results were encouraging. To this end, the investigators said that they would replicate the study in order to arrive at a certain number of statistically significant observations.<sup>45</sup>

The direction and findings of the Alhinc et al. study, as well as those of the present study seem to be in accord on one conclusion. This is, that oral performance in a foreign language can be effectively tested by the combined use of the Language Laboratory and visual stimuli. This common conclusion should therefore be sufficient to warrant continued experimentation

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<sup>45</sup>Alhinc et al., op. cit., pp. 156-167.





along these lines.

In defending the 'film fixe' (filmstrip) as a better visual conditioner, than, say photographs or animated films, Malandain states:

It is not sufficient that the picture be authentic for the student to perceive exactly what one wishes to show him. In addition, the meaningful elements of the picture must be so organized that they may be perceived. It is for this reason, moreover, that the authors of the method have had recourse to sketching and not to photography for their illustrations. In fact, sketching allows for simplification of situations, suppression of useless details, and, on the other hand, underlines those essential elements, which give meaning to the dialogue.<sup>46</sup>

The point made here is a valid one, which seems to be in essential accord with the theories and findings of others who think that the filmstrip is one of the most valuable, economical and practical of the various types of audio-visual second-language teaching programs now in use.

The last study to be reviewed is that of James Miller. The purpose of the study was to find out how filmstrip visuals affect the teaching and learning of beginning French at the grade seven level. Among the questions it sought to answer were, (1) "Do filmstrip visuals contribute to proficiency outcomes in listening, reading, and speaking when used with a modern, audio-lingual foreign language methodology?" (2) "Are visuals more effective with students of low language-aptitude than with students of high

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<sup>46</sup>Claude Malandain, (Relevant citation translated by the writer of this study). Utilisation des films fixes pour l'enseignement des langues vivantes aux enfants., Didier, Montréal, Paris, Bruxelles, 1966., p. 9.



language aptitude?"<sup>47</sup>

The two participating teachers in the study each taught a pair of classes, one audio-lingual, the other audio-lingual-visual. One of the two modern approaches was based on the use of filmstrip visuals while the other made no use of visuals. The students were given a pre-test to determine language aptitude. A standardized achievement test was then administered at the end of the school year to all students. This was intended to determine proficiency in the listening, reading, and speaking skills. The data from this test were arranged in a "two-by-two-by-two mixed factorial design and was processed by analysis of variance."

The analyses indicated higher mean proficiency scores in five of six categories, favoring the filmstrip visual methodology. A slightly higher score by one group in speaking favored the non visual method. Differences significant at the .001 level were found in favor of the filmstrip methodology for listening over the non visual method. Significant differences at the .05 level favored the visual approach for the reading skill and no significant differences were found in favor of low aptitude students.

Miller concluded, in part, that the study had very important implications and should therefore be replicated. He

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<sup>47</sup>James Dale Miller, "The Visual Adjunct in Foreign Language Teaching," University Microfilms, A Xerox Company, Ann Arbor, Michigan, U.S.A. 1964.



said that certain other factors should be controlled in a replicated study - IQ and teacher competency to handle the method, and the variables of English grade point and total grade point.

From the review of literature presented in this section, it appears that the majority of studies supports the use of the filmstrip in the teaching of a foreign language, especially at the beginners' stage. Certain discrepancies are evident, however, as to wherein reside the foremost claims of such programs. The evidence in respect of the different language skills that may be best developed through use of this medium is conflicting. Some of the studies see the filmstrip as being strong in developing proficiency in speaking and listening comprehension, but weak as regards reading and writing. Other studies have found the direct opposite. A few of the writers have confessed to certain areas of weakness in the experimental design of their studies, and two of the studies were incomplete. These may well have been contributing factors to the conflicting results.

Nonetheless, the fact that the studies were done indicate a recognition of the need to undertake such studies. It is at the same time disheartening to note that the few filmstrip programs treated in comparative studies were always compared with a non-visual rather than another visual program. In fact, it is unfortunate that such comparisons, most essential for the comprehensive evaluation of different audio-visual second-language programs, should be so often overlooked.





## V. SUMMARY

Mention was made earlier in this Chapter of the lack of studies comparing visual media in foreign language teaching and testing. Of the two types of visual testing modes compared in this study, the literature reviewed seems to favor the fixed medium somewhat more than the animated. It is difficult to say conclusively, however, that one mode is decidedly superior to the other as a testing medium since the two have not been compared for their relative efficiency in this regard. Undoubtedly, more studies seem to have been done on the fixed than on the animated mode. The apparent preference for televised over filmed teaching courses may well have been responsible for this. However, those studies that have dealt with filmed programs have amply demonstrated that films can conceivably be used with great effectiveness in foreign language testing. More research here is suggested.

The review has indicated generally the type of research that has so far been done. The implication is that newer areas of investigation must now be broached. Previous studies have shown that the use of the visual media in question can be very effective in the teaching and testing of foreign languages. It now remains to be discovered how effective these can be, and how best they can be applied in order to attain their objectives. Obviously then, comparative studies of different types of visuals are imperative. This is most true of those visuals that are employed among beginners at the elementary level. Finally, research in the field must be continued along the lines that have been suggested. This seems the surest path to a true and valid assessment of the worth of such postulants to be regarded as sound instruments of foreign language teaching and testing.



## CHAPTER III

### THE DESIGN OF THE STUDY

Four groups (two experimental and two control) were tested by the presentation of two silent 16 mm. films in color (comprising two different concepts) and two filmstrips, without sound, comprising the same two concepts as the films. In each of the experimental groups, twenty seven pupils sat the tests. Thirty pupils took the tests in each of the control groups. All pupils were in grade four. The pre-testing instruction was given over a period of seven months. The content of the teaching programs of all four groups differed only in the instructional modes used to present it and the teaching objectives were the same: to teach French to pupils in elementary schools with a view to developing in the pupils a degree of proficiency in the speaking of French commensurate with the period of time spent in learning the language.

Pupils in the two control groups were instructed audio-lingually in French. The pupils of each experimental group followed that audio-visual French program which was used in their particular School system. Thus, one group was taught the BONJOUR LINE program, and the other the PARLONS FRANÇAIS program.

The St. Albert Protestant Separate School System fulfilled the requirement of teaching the fixed film program, BONJOUR LINE, to all pupils in Grade 4. Similarly, the Edmonton Separate School Board taught the moving picture program, PARLONS FRANÇAIS, to all pupils in Grade 4. Their pupils constituted the population from which the



experimental samples were drawn.

Saskatoon was the nearest urban centre outside of the Province of Alberta, where all Grade 4 pupils followed a non audio-visual French program (i.e., the audio-lingual program recommended by the Chicago Board of Education).<sup>1</sup> Pupils from the Separate School System of Saskatoon were therefore used for the selection of the control groups.

The University of Saskatoon gave the necessary technical assistance required, as did the Faculty of Education of the University of Alberta. These two institutions provided Language Laboratories, film projectors, and filmstrip projectors for the running of the tests. Staff familiar with and experienced in the operation of the two language laboratories used in the project acted as invigilators and assistants during the tests. The same was true of the Staff that operated the film and filmstrip projectors.

#### NATURE OF THE SAMPLE

Before the selection of the four groups involved in the study, the Principals and teachers of the pupils, in consultation with the pupils themselves, removed from the lists of intended testees those pupils who spoke French at home, and

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<sup>1</sup>Chicago Board of Education, Curriculum Guide for French K-6, Chicago, Board of Education, 1963.





those who had had any type of instruction in French prior to September, 1967.

#### POPULATION AND ORGANIZATION OF THE POPULATION

The total population from which the testees were selected was seven hundred and forty three (743). This number comprised 111 from St. Albert, 307 from Northern Edmonton, and 325 from Saskatoon. Thirty randomly selected pupils were drawn from each of St. Albert and Northern Edmonton, in such a manner that each group consisted of 15 boys, 15 girls. The members of these two groups comprised the experimental groups of the study. The St. Albert group was designated as Group A (experimental), and the group from Northern Edmonton as Group B (experimental). The population within each of the two school systems was taught by its regular teachers, four in St. Albert, twelve in Northern Edmonton.

Sixty pupils (30 boys, 30 girls) were selected at random from the Saskatoon Separate School System. These pupils were so selected that they formed, randomly, two groups of thirty (15 boys, 15 girls) each. Each of these two groups was then arbitrarily assigned as a control group to either Group A or Group B. The designation for the control groups is Group C (control), Group D (control). The regular teachers for the pupils of these groups numbered thirteen; and the pupils came from eleven different schools.





The random selection of an equal number of boys and girls in each of the four groups was necessary to ensure an even balance of the sexes within groups and between groups. Otherwise, the findings may have been biased by the sex variable.

In the seven months prior to the selection of the random samples just described, the teachers were left free to instruct their classes in accordance with the instruction booklets of their respective programs. The provision was made, however, that no teacher was to use any but the one method of instruction approved by the investigator for a given set of pupils. This was done to ensure that each intended testee was exposed to only one method of instruction during the pre-testing period. The seven months of instruction lasted from the beginning of the School year in September, 1967, to the end of April, 1968. The reason for this was that the testing program covered the amount of French the pupils should be able to use at the end of that period of time.

Each testee was assigned a number from 1 to 120, and this number, along with the corresponding numbered tape, was used by that testee during the tests. The groups were then organized so that, in the first instance, Group C acted as the control group for Group A (experimental), and Group D served as the control for Group B (experimental). This pattern of pairing ensured that the first half of Part I of the testing program on each of the two days of testing utilized the type of visual stimuli with which a given experimental group was familiar. The second half of Part I then contained for each experimental group the unfamiliar visual conditioner. At the same time, both halves of Part I would be equally unfamiliar to both control



groups. Moreover, this sort of organization of the groups and presentation of the visual stimuli facilitated cross-checking within and between the group scores that had to be correlated and tested for significance.

Sources of additional Data. After selection of the four groups, the investigator obtained from the Principal of each school the following data on each intended testee: Age as of April 30, 1968, I.Q. rating, Grade Point Average, Grade in French, number of classes weekly in French and duration in minutes of each class in French.

#### THE TESTING PROGRAM

Films and filmstrips based on the types of visual stimuli used in the two audio-visual French courses prepared for elementary schools - BONJOUR LINE, (sketches in color, projected on a screen), and PARLONS FRANÇAIS, (moving pictures in color), were used as the main testing instruments. Two language laboratories, six standard tape recorders, and one hundred and twenty magnetic tapes completed the testing ensemble.

#### PREPARATION OF THE TESTING PROGRAM

First of all, the two above-mentioned audio-visual programs were carefully examined for similarities and differences. Next, an examination was made of the techniques used in the preparation of the films and filmstrips used in these programs. The investigator then selected materials common to both programs as well as to the programs



of the intended control population. These materials were then organized to present two different situations.<sup>2</sup> Each of these situations tells a little story in pictures. Amateur actors were trained to act out these stories; and when they had attained a sufficient degree of proficiency, a professional film-making crew rehearsed them and subsequently filmed them in action.

The films were processed and color photographs were taken of those sections that were needed to make sketches that portrayed as closely as possible the same situations as the films. These sketches, placed in their proper sequence, were the raw materials from which the filmstrips were made. Thus both the films and the filmstrips had essentially the same two situations. For purposes of convenience the situations are called Concept 1 and Concept 2, each concept being the same in either the Film or Filmstrip medium. Hereafter in the Study these will be referred to as Concept 1 or 2 (fixed), or Concept 1 or 2 (animated)

Two concepts were used in order to form a split-half test, whose scores could be correlated if necessary. Moreover, it was felt that the use of two concepts would afford greater discrimination in the range of pupil responses in the face of differing situations. More reliable results could thus be assured, since the

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<sup>2</sup>See Appendix B for the shooting script of each concept.





scores on both concepts combined should alleviate any bias of a single concept.

The visual stimuli of the testing program were so prepared that the materials presented in them remained faithful to the programs on which they were modelled, without being an exact duplication of the program materials. At the same time, all the items (i.e. the response-eliciting situations) used in the testing films (fixed and animated) are common to all the programs and include only material that had been covered by the intended testees up to the time of testing.

With respect to the two experimental groups, the films (fixed and animated) were so prepared that neither group would have the advantage of any of the films being weighted in its favor as regards items being placed in situations familiar to either of the two programs on which the testing films were modelled.

#### TESTING PROCEDURE

The actual tests were administered over a period of two days. On the first day, Groups A and C did the tests in similar language laboratories in Edmonton and Saskatoon respectively. In Saskatoon, there was sufficient accommodation for testing all the pupils of the Group at one sitting in individual booths. In Edmonton, on the other hand, six standard tape recorders were used to make up for the deficit of booths in the Language Laboratory, as there were only twenty four booths. The pattern of this first



day was repeated exactly for Group B in Edmonton, and Group D in Saskatoon, on the second day.

The order of presentation of the films and filmstrips on the first day differed from the order of presentation on the second day. (See Table I(a)). Before the start of the tests, the testing apparatus was checked in order to ensure that it was functionally sound. Care was also taken in operating the tape recorders to ensure that no problems occurred that might upset the testees.

In spite of these precautions, there was a malfunction of two booths and two tape recorders, which reduced the number of pupils in each of Groups A and B to twenty eight. The pupils' lack of experience with the equipment did not enable them, apparently, to note the technical failure. Absence on their respective testing days of one pupil from each of Groups A and B further reduced the number of pupils in each of these two groups to twenty seven.

The total number of pupils who completed the tests was, therefore, One Hundred and Fourteen. The distribution for each group was as follows: Group A - 27, Group B - 27, Group C - 30, and Group D - 30.

Each test consisted of three sections. A break of ten minutes was allowed between Part I and Part II of the test, and a further break of fifteen minutes between Part II and Part III. There was a time allowance of five to six minutes for pupils' oral responses to Concepts 1 and 2 in Part I. Six to seven minutes



were allowed for responses to Concepts 1 and 2 in both Parts II and III.

The invigilator read the instructions<sup>3</sup> for each section to the pupils before showing them the appropriate film or film-strip. In these instructions, the pupils were carefully directed as to what they were expected to do in the testing situation. At the end of the testing period, the invigilators and their assistants replayed some of the tapes, in parts, to make sure that the recording was done. The tapes were then rewound on to their original spools, collected and secured for transcription.

In Part I of the tests, the films and filmstrips were shown in segments, and in Parts II and III, they were shown in their entirety. Table I(a) shows the order of presentation of the films and filmstrips; and indicates which group are experimental, which are control. It also indicates the mode with which each experimental group is familiar, and when the viewing was segmented, when it was in its entirety (whole).

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<sup>3</sup>See Appendix C.



TABLE I(a)  
ORDER OF PRESENTATION OF FIXED AND ANIMATED  
VISUAL STIMULI

		Experimental Groups	Control Groups	Part I	Part II	Part III
		Familiar with named mode only	Unfamiliar with either mode	Segmented viewing	Whole viewing	Whole viewing
FIRST DAY	A  (FIXED)	C		Concept 1 (Fixed)	Concept 1 (Animated)	Concept 1 (Fixed)
				Concept 2 (Animated)	Concept 2 (Animated)	Concept 2 (Fixed)
SECOND DAY	B  (ANIMATED)	D		Concept 1 (Animated)	Concept 1 (Fixed)	Concept 1 (Animated)
				Concept 2 (Fixed)	Concept 2 (Fixed)	Concept 2 (Animated)





## THE TESTING INSTRUMENTS

Robert Lado, (1961) writing of speaking tests, said:

"...testing the ability to speak a foreign language is perhaps the least developed and the least practiced in the language testing field."<sup>4</sup> Pimsleur admits that the "statement is true or at least was true until very recent years when serious attacks have at last been made upon the problem of testing the speaking skill."<sup>5</sup>

In spite of this apparent progress, Pimsleur notes that only three tests of speaking proficiency have appeared which meet the criteria of validity, reliability, ease of administration, and objectivity of scoring. These are French Speaking Proficiency Test (Pimsleur, 1964), the Speaking Test of the MLA Cooperative Foreign Language Tests (1964), and the Speaking Test of the MLA Foreign Language Proficiency Tests for Teachers and Advanced Students (1962).

The first of these tests, the French Speaking Proficiency Test (Pimsleur) relates closely, in part, to the testing technique employed in the present study. Part 1 of Pimsleur's test measures knowledge of concrete vocabulary by presenting pictures of common objects, in a booklet, which pupils must name in French. Part of

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<sup>4</sup>Robert L. Lado, Language Testing, London: Longmans, Green and Company Ltd., 1961.

<sup>5</sup>Paul Pimsleur, "Testing Foreign Language Learning" in Trends in Language Teaching Edited by Albert Valdman, Indiana University, McGraw-Hill Book Company, New York/St. Louis/San Francisco/Toronto/London/Sydney, 1966, pp. 175-214.



the testing purpose of this study is to have the pupil use his French vocabulary to tell stories that have been presented visually by silent films and filmstrips.

Part 2 of Pimsleur's test concerns the use of abstract words, such as "busy, empty, or happy." The pupil sees a pair of pictures - one in which a boy is smiling, and another in which the same boy is crying. In the first the caption says "Le garçon est heureux." The second caption says "Le garçon est ....." and the pupil has to supply the word which correctly completes the caption. The testing procedure of this aspect of the present study differs from Pimsleur's in that the films and filmstrips are so designed that the pupil may make use of abstract and concrete words at random, without consciously realizing that he is doing so. In addition, the visual stimuli are so organized as to suggest abstractions. In short, the power of suggestion was assumed to be sufficient to elicit the correct abstract word.

"To measure achievement truly, tests should measure the learnings in which the student has been or is at the moment engaged. Such tests should reflect the objectives, the methods and the materials embodied in these learnings. The logic of this demands that the preparation of these tests follow closely the nature of the materials."<sup>6</sup>

The testing instruments (films and filmstrips) of this study were prepared with the above quotation as a guiding principle. As a

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<sup>6</sup>Nelson Brooks, Language and Language Learning Theory & Practice, Harcourt, Brace and World, Inc., New York, Chicago, Atlanta, Dallas, Burlingame, 1960, p. 160.



result, the concepts presented by the testing instruments embodied (1) items common to the instructional programs of the intended testees, and (2) images and situations resembling those of the original teaching programs, although not identical with them. There was, in fact, no attempt in the preparation of the test films and filmstrips to reproduce models faithful in detail to the sketches of BONJOUR LINE or to the animated persons and puppets of PARLONS FRANÇAIS. There was, rather, an attempt to approximate the types of visual stimuli employed in programs similar to the two cited above. In this way, it was felt, the testing instruments could more accurately discriminate as to the effectiveness of the two types of visual stimuli under comparison.

Both testing instruments were designed to test (1) the effectiveness of purely visual stimuli in eliciting oral responses in French by pupils who have been taught French audio-visually; and (2) the effectiveness of purely visual stimuli in eliciting oral responses that show how well the visual stimuli can be comprehended and interpreted. The films were modelled on those of the PARLONS FRANÇAIS teaching program and the filmstrips on those of the BONJOUR LINE program.

A similar filmstrip testing instrument was used by Mialaret and Malandain in their study "La perception du film fixe chez l'enfant, "(1962). No mention was made of its reliability or validity, although the instrument seemed to have functioned reliably





in that study. In fact, that study made use of one of the lessons of the Voix et Images<sup>7</sup> program as its testing instrument. The Voix et Images program is similar in design to the Bonjour Line program on which the filmstrips of this study are based. The former program, however, is intended for adult beginners, whereas the Bonjour Line program has been conceived for beginners between the ages of eight and eleven.

In informal testing the present filmstrip testing instrument was found to be well suited to the purpose for which it was designed. No item was found to be so ambiguous as to be misunderstood or misinterpreted by more than 5% of a total population of 50 persons (adults and children) on whom it was tried prior to its formal presentation in the tests. The same holds true for the testing films.

There was no precedent for the test films. Consequently, it was assumed that since the films and the filmstrips were identical in concepts and intent, the reliability of the filmstrips should hold true for the films. An estimate of the validity of the tests was assumed to be dependent on the correlation of pupils' scores on the tests with their actual French grades in the classroom (cf. Paul Pimsleur, *op cit.*, p. 181.)

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<sup>7</sup>Voix et Images de France, Philadelphia, Pa.: Chilton Company, Book Division, 1962.



## THE MEASURING INSTRUMENTS

### 1. Comprehension

The main features of each of Concepts 1 and 2 (films and filmstrips) numbered six. One point was scored for each feature recognized, using a slightly modified version of the scoring system employed by Mialaret and Malandain.<sup>8</sup> The scores were then converted to a five point scoring scale as follows:

Excellent.	- Main features of film/filmstrip recognized.....	5 points .
Good.	- Five features recognized.....	4 points.
Fair.	- Three or four features recognized.....	3 points.
Poor.	- One or two features recognized.....	2 points.
Unacceptable.	- No features recognized, although pupils responded.....	1 point.
Not Attempted.	- No response given.....	0 point.

### 2. Interpretation

The maximum possible number of features to be interpreted in each of Concepts 1 and 2 (films and filmstrips) was thirteen. One point was scored for each feature and the results were then converted to a five point scale. The scoring scale for this was also modelled on the evaluative system used by Mialaret and Malandain.<sup>9</sup>

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<sup>8</sup>G. Mialaret, C. Malandain, "La perception du film fixe chez l'enfant," in Études de Linguistique Appliquée, Faculté des Lettres et des Sciences Humaines, Université de Besançon, Didier, Paris, 1962, p. 97.

<sup>9</sup>Op. cit., p. 98.



- Excellent. - Correct or almost correct in keeping with the intended meaning of the film/filmstrip..... 5 points.
- Good. - Probable in relation to the context in which items are presented..... 4 points.
- Fair. - Partially probable in relation to the context in which items are presented..... 3 points.
- Poor. - Incorrect or unlikely interpretation within the context..... 2 points.
- Unacceptable. - "Individual" interpretation, which shows excess of imagination or phenomenon of projection..... 1 point.
- Not attempted. - No interpretation..... 0 point.

### 3. Quality of Oral Expression

A two dimensional system was conceived and developed to evaluate the scores on this variable for each concept in both media. The first dimension accounted for scores on structural accuracy of the oral expression, and the second determined the scores on the contextual accuracy of the oral response. A five point rating scale was used to evaluate scores on each of (a) structural accuracy, and (b) contextual accuracy.

The scoring scale for structural accuracy differs very slightly from that used to evaluate Structure (sentence form) in the Oral Production Rating Scale of the MLA Cooperative Tests. The scoring scale for contextual accuracy is modelled on that used to evaluate Fluency in the Oral Production Rating Scale of the MLA Cooperative Tests.<sup>10</sup> The differences between this last named

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<sup>10</sup> MLA Cooperative Foreign Language Tests, Princeton, N.J.: Educational Testing Service, 1964.



scale and that of the present study vary inversely with the specific points to be graded.

Scoring Scales

Structural Accuracy

- Excellent.        - Wide range of patterns with no errors ..... 5 points.
- Good command of basic patterns taught with occasional errors ..... 4 points.
- Fair command of basic patterns with few errors or wider command with many errors .... 3 points.
- Poor command of elementary patterns (or few basic patterns) and/or use of a mixture of French and English, comprehensible to the average French-English bilingual ..... 2 points.
- Unacceptable.    - Complete lack of ability to deal with basic structural patterns .... 1 point.
- Not Attempted.   - No responses given ..... 0 point.

Contextual Accuracy

- Vocabulary used meaningfully in context, and entirely in French ..... 5 points.
- Vocabulary used meaningfully, but with slight contextual errors ..... 4 points.
- Vocabulary used meaningfully, but with grave contextual errors ... 3 points.
- Vocabulary used meaningfully in context, with aid of English vocabulary, and/or with very grave contextual omissions ..... 2 points.
- Vocabulary used wrongly, or answer given in isolated words or incomprehensible sentences./ English vocabulary with few French words correctly used ..... 1 point.
- Vocabulary used entirely in English, or not used at all ..... 0 point.





Analyses of the foregoing scores provided the data on which the Null Hypotheses were tested.

#### RELIABILITY OF RATINGS

All scoring was done by the writer over a period of two weeks. Every attempt was made to score in accordance with the quantitative scoring scales used in order to ensure consistency of rating. After all scoring was completed, the writer rechecked scores at random to see whether this consistency of rating was maintained. It was felt that the quantitative quality of the scoring scales aided very much in the desired objectivity of the marking.

Any other scorer or scorers using these scales and the same data should be expected, within reason, to arrive at marks that do not differ significantly from those that were assigned by the present writer.

#### STATISTICAL PROCEDURE

An IBM 360/67 computer program was used to analyze the data relevant to the testing of the hypotheses listed in Chapter I. These statistics were calculated from the raw scores of each variable to be examined. An independent t test was used to test the difference between two means, when the hypothesis warranted such a test. Hypotheses 1 and 4 were tested accordingly. The results are reported at the .01 and .05 levels of significance.



Hypothesis 2 was tested by noting the directional patterns of scores between a group that was unfamiliar with a given mode and a group that was familiar with that mode. The pattern of such comparisons, rather than individual comparisons, was used to assess the effects of a group's familiarity with a mode. Scores of each individual group were compared inter-modally.

Next, means were compared intra-modally between groups on each variable two at a time following an F test. The resultant mean differences were then compared inter-modally between two groups at a time in order to determine which order of presentation was favored by the relative gains. The total pattern of these gains, in relation to order of presentation, was used to test Hypothesis 3. Hypothesis 5 was tested by correlation. These results are reported at the .01 and .05 levels of significance.

The statistical treatment outlined above was used, where applicable, in the analysis of data which follows in Chapter IV.



## CHAPTER IV

### ANALYSIS OF DATA

After the results of the transcribed oral tests were recorded on appropriate sheets, the raw scores and programmed instructions for the calculations desired were fed into an IBM 360/67 computer. From these the following were calculated: means, standard deviations, probability of  $t$  for differences between variances and between means, correlations, and mean differences. The significance of the difference between variances and between means was thus computationally tested.

In addition, the following were provided: the results of tests of significance on differences between all pairs of means, two at a time following an  $F$  test (Newman-Keuls comparison between ordered means)<sup>1</sup>, and the probability matrix for Scheffe's multiple comparison of means.<sup>2</sup>

The above calculations were used in various combinations for the analysis of data which follows.

#### I. ORDERED PRESENTATION OF ANIMATED AND FIXED VISUAL STIMULI

Table I(b) reiterates, for the reader's convenience,

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<sup>1</sup>B.J. Winer, Statistical Principles in Experimental Design, McGraw-Hill Book Co., Inc., New York, San Francisco, Toronto, London, 1962, p. 102.

<sup>2</sup>Ibid., p. 88.

## CHAPTER IV ANALYSIS OF DATA

After the results of the transcribed oral tests were recorded on appropriate sheets, the raw scores and programmed instructions for the calculations desired were fed into an IBM 360/57 computer. From these the following were calculated: means, standard deviations, probability of  $t$  for differences between variances, and between means, correlations, and mean differences. The significance of the difference between variances and between means was thus computationally tested. In addition, the following were provided: the results of tests of significance on differences between all pairs of means, two at a time following an  $F$  test (Newman-Keuls comparison between ordered means)<sup>1</sup>, and the probability matrix for Scheffe's multiple comparison of means.<sup>2</sup>

The results of the analysis of the data are presented in the following tables. The first table shows the means and standard deviations for the oral tests. The second table shows the means and standard deviations for the written tests. The third table shows the means and standard deviations for the combined oral and written tests. The fourth table shows the means and standard deviations for the combined oral and written tests, and the fifth table shows the means and standard deviations for the combined oral and written tests, and the sixth table shows the means and standard deviations for the combined oral and written tests.



the information given in Table I(a), Chapter III. It outlines in detail the testing procedure that was employed in the research project, while indicating which groups are control, and which are experimental. Table I(b) also shows the mode with which each of the experimental groups was familiar, and the order in which the animated and fixed visual stimuli were presented to each of the four groups. Thus, in Part I on the first day of testing, Group A (experimental, familiar with the fixed mode only), and Group C (control, unfamiliar with both the fixed and the animated mode) both viewed segmentally Concept 1 (fixed) and Concept 2 (animated) in that order.

Contrarily, in Part I on the second day of testing, Group B (experimental, familiar with the animated mode only), and Group D (control, unfamiliar with either mode), viewed segmentally Concept 1 (animated) and Concept 2 (fixed) in that order. In Part II, Groups A and C viewed as wholes Concept 1 (animated) followed by Concept 2 (animated), whereas Groups B and D viewed Concept 1 (fixed) followed by Concept 2 (fixed).

In Part III, A and C viewed as wholes Concepts 1 (fixed) and 2 (fixed) in that order; and B and D viewed as wholes Concepts 1 (animated) and 2 (animated) in that order. From this outline it is clear that Groups A and C had the visual stimuli in the following order: Part I - Concept 1 segmented (fixed) followed by Concept 2 segmented (animated); Part II - Concepts 1 and 2 whole (animated); Part III - Concepts 1 and 2 whole (fixed).



TABLE I(b)  
ORDER OF PRESENTATION OF ANIMATED AND  
FIXED VISUAL STIMULI TO  
GROUPS A, B, C, D

Experimental Groups	Control Groups	PART I	PART II	PART III
Familiar with named mode only	Unfamiliar with both modes	Segmented viewing	Whole viewing	Whole viewing
A  (FIXED)	C	Concept 1 (Fixed)	Concept 1 (Animated)	Concept 1 (Fixed)
		Concept 2 (Animated)	Concept 2 (Animated)	Concept 2 (Fixed)
B  (ANIMATED)	D	Concept 1 (Animated)	Concept 1 (Fixed)	Concept 1 (Animated)
		Concept 2 (Fixed)	Concept 2 (Fixed)	Concept 2 (Animated)

Groups B and D had the same concepts in Part I, as did Groups A and C, save that the order of presenting the modes was reversed. In Part II, B and D saw concepts 1 and 2 whole (fixed), in that order, followed by concepts 1 and 2 whole (animated), in that order.



Strictly speaking, the segmented presentation of the visual stimuli (Part I) was intended to fulfil a dual role. Firstly, it was intended to discover how well the visual stimuli presented in segmented form were capable of establishing comprehensibility and interpretability outside of their total narrative context. Secondly, it attempted to find out how well segmented scores on comprehension and interpretation on either concept would correlate with their corresponding whole scores, irrespective of type of media or order of presentation of the segmented and whole visual stimuli.

The intention was to have segmented viewing completely independent of whole viewing on separate days, in order to realize the first objective; and then, to correlate the scores on segmented and whole viewing on the relevant variables so as to achieve the second objective. Unfortunately, it was not possible to have the same set of pupils for more than one day. The consequence was that the time lapse between segmented and whole viewing for any one group was in terms of minutes rather than hours, as had been planned. This smaller span of time between segmented and whole was perhaps not sufficient to eliminate the influence of segmented viewing on whole scores.

Consequently, interpretation of the various analyses of data will take into account whatever influence, favorable or unfavorable, was exerted on whole scores by the previous viewing of the two concepts in segmented form. This apart, whole viewing



will be treated as a separate entity.

## II. COMPREHENSIVE PREVIEW OF ANALYSIS OF DATA FOR HYPOTHESES I, II, AND III

Table II is intended as a comprehensive outline of the analysis of data used to test the first three hypotheses. As such, reading from top left down, it gives the name of each group, indicating whether the group is an experimental (i) or a control (o) group. In columns 2 and 3 respectively, it indicates the testing modes and the order in which each was taken. For each of the variables (comprehension, interpretation, structural and contextual accuracy, overall), columns 4-7, Table II gives the following:

- (a) the mean score and standard deviation of each group in each of the two modes (animated and fixed);
- (b) information that all groups scored higher on the fixed mode for all variables (++);
- (c) an indication that a group had a positive (+) or a negative (-) mean gain on the mode it took last, as evidenced by the differences between a group's means on both modes ( $\bar{D}$ );
- (d) the probability of t for the difference between variances (P of t variance) and the probability of t for differences between modal means (P of t means). Lastly, explanation of the symbols used in the Table are given in footnotes.

The analyses of data for the three hypotheses are presented separately in other Tables, which draw attention to the relevant features to be discussed as they apply in turn to each of the hypotheses.





TABLE II  
COMPREHENSIVE OUTLINE SHOWING RELATIONSHIP OF SCORES  
AND GROUPS TO ANALYSIS OF DATA FOR THE FIRST  
THREE HYPOTHESES  
(SCORES FOR INDIVIDUAL GROUPS)

Group	Mode	Order of Pres- entation	Comprehension		Interpretation	Structural and Contextual Accuracy	Overall
A <sub>(i)</sub>	Animated	1	$\bar{X}$	2.6667	1.9259	5.2222	9.8148
			SD	1.4142	1.0350	2.7363	4.9228
	Fixed	2	$\bar{X}$	3.4444++	2.7778++	6.3333++	12.5556++
			SD	2.0255	1.6718	3.2344	6.7216
			D	.7777+	.8519+	1.1111+	2.7408+
	P of t variance		.401	.004	.313	.048	
	P of t means		.000	.002	.048	.010	
	Fixed	1	$\bar{X}$	4.1852++	3.5926++	8.0000++	15.7778++
			SD	2.3260	2.3376	4.0982	8.5482
	Animated	2	$\bar{X}$	3.7778	3.1852	6.8889	13.8519
SD			1.9814	2.1530	3.6585	7.5617	
D			.4074-	.4074-	1.1111-	1.9259-	
P of t variance			.274	.523	.454	.389	
P of t means			.228	.177	.083	.112	
C <sub>(o)</sub>	Animated	1	$\bar{X}$	5.9333	5.3333	6.1333	17.4000
			SD	2.1804	2.4117	4.1251	7.0984
	Fixed	2	$\bar{X}$	6.8000++	6.3000++	7.2333++	20.3333++
			SD	2.2190	2.6929	4.5764	7.7163
			D	.8667+	.9667+	1.1000+	2.9334+
	P of t variance		.890	.397	.160	.125	
	P of t means		.005	.016	.002	.001	
	Fixed	1	$\bar{X}$	5.2333++	4.5333++	7.6333++	17.4000++
			SD	1.4420	1.5742	2.5289	4.8048
	Animated	2	$\bar{X}$	4.7000	3.9333	6.8667	15.5000
SD			1.6955	1.9780	2.8945	5.3666	
D			.5333-	.6000-	.7666-	1.9000-	
P of t variance			.101	.109	.312	.399	
P of t means			.002	.034	.051	.010	

+    Named group has positive mean gain on the mode taken last.  
-    Named group has negative mean gain on the mode taken last.  
++   Named group has higher mean score on the fixed mode over the animated mode.  
(i)   Named group was familiar with the mode taken last.  
(o)   Named group was unfamiliar with either mode.



### III. INTER-MODAL COMPARISON OF SCORES FOR TOTAL GROUP

The hypothesis stated that the type of visual stimuli (fixed or animated) does not significantly affect pupils' scores on (a) comprehension, (b) interpretation, (c) structural and contextual accuracy, (d) overall. This hypothesis was tested by comparing the total scores of all pupils on each of the variables (a) to (d) on the animated mode with each of the corresponding variables (a) to (d) on the fixed mode.

Mean difference ( $\bar{D}$ ) for each inter-modal comparison is noted under the relevant variable, with the notation <sup>(a)</sup> indicating that the mean difference favored the fixed over the animated mode in every instance. The fixed mode is therefore seen to be the easier of the two modes.

The probability of  $t$  for differences between means ( $P$  of  $t$  means) was 0.000 for each pair of comparisons. The differences between modal means were, therefore, significant on every count. These results which are shown in Table III point to the rejection of the null hypothesis.



TABLE III  
INTER-MODAL COMPARISON OF MEAN DIFFERENCES  
FOR TOTAL GROUP

	Compre- hension	Inter- pretation	Structural and Contextual Accuracy	Overall
$\bar{D}^a$	0.649	0.711	1.018	2.378
P of t means	.000	.000	.000	.000

N= 114.

<sup>a</sup> all mean differences ( $\bar{D}$ ) favor the fixed over the animated mode.





#### IV. INTER-MODAL COMPARISON OF SCORES FOR INDIVIDUAL GROUPS

Hypothesis I was further tested by comparing the total scores of each of the four groups on variables (a) to (d) animated, with the total scores respectively of variables (a) to (d) fixed. These scores are to be found in Table II.

It will be recalled from the inspection of that Table that in every instance the mean scores of each group for the fixed mode were higher than the mean scores for the animated medium. Similarly, it will be noticed that in Table IV the inter-modal mean differences ( $\bar{D}$ ) favor the fixed over the animated mode for each of the four groups under study. Detailed examination of Table IV focuses attention on the features relevant to this further test of the hypothesis.

With regard to 'comprehension', column 3, the probability of  $t$  for differences between means is significant for Groups A, C and D, but not significant for Group B. On 'interpretation', column 4, significant differences are found for each of Groups A, C and D, but no significant difference is noted for Group B.

On 'structural and contextual accuracy' no significant differences are noted for Groups B and D, but differences significant at or beyond the .05 level are found for Groups A and C. 'Overall', column 6, all the groups except Group B have differences significant at the .01 level. The significance level of the probabilities of



TABLE IV  
INTER-MODAL COMPARISON OF MEAN DIFFERENCES  
FOR INDIVIDUAL GROUPS

Group	Mean Differences	Compre- hension	Inter- pretation	Structural and Contextual Accuracy	Overall
	$\overline{D}^a$	0.777	0.852	1.111	2.741
A	P of t means	.000	.002	.048	.010
	$\overline{D}$	0.407	0.408	1.111	1.926
B	P of t means	.228	.177	.083	.112
	$\overline{D}$	0.867	0.967	1.100	2.933
C	P of t means	.005	.016	.002	.001
	$\overline{D}$	0.533	0.600	0.766	1.900
D	P of t means	.002	.034	.051	.010

<sup>a</sup> all mean differences ( $\overline{D}$ ) favor the fixed over the animated mode.



t for the inter-modal mean differences (Table IV) support the rejection of the null hypothesis as evidenced in Table III. The conflicting differences of significance on each of the dependent variables in Table IV help to account for the consistency of the significant differences noted in the first test of the hypothesis (Table III).

Contingency Tables I and II, in conjunction with Table IV, facilitate interpretation of the significant differences of the total scores. Contingency Table I gives the frequency distribution of scores for each of the four groups on the variables 'comprehension', 'interpretation', 'structural accuracy', and 'contextual accuracy' in the animated medium. The total (N) for each group is also given at the bottom of each column, in which the frequency of scores from zero (0) to ten (10) are noted for each group on each of the above-mentioned variables. Contingency Table II gives identical information for the fixed mode.

The scores presented in the Contingency Tables were arrived at by combining each individual's whole score on concept 1 with his whole score on concept 2 of a given variable within a given mode. For example, the whole scores on concepts 1 and 2 'comprehension' (fixed) are noted as the single score 'comprehension'. All scores given henceforth refer to whole scores, except where stated otherwise.



CONTINGENCY TABLE I  
FREQUENCY DISTRIBUTION OF SCORES OF GROUPS  
A, B, C, AND D, ON FOUR NAMED VARIABLES

ANIMATED MODE

SCORES	COMPRE- HENSION				INTER- PRETATION				STRUCTURAL ACCURACY				CONTEXTUAL ACCURACY			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
10	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	2	0	0	1	1	0	0	0	1	0
8	0	0	8	1	0	0	5	0	0	0	2	0	0	1	1	0
7	0	2	4	3	0	1	4	2	0	1	1	0	0	0	1	2
6	1	3	6	3	0	2	4	4	1	3	0	3	1	4	1	0
5	1	2	5	9	0	3	4	4	1	2	1	1	0	1	0	3
4	6	7	0	9	3	2	4	6	6	7	3	11	6	4	3	7
3	5	5	5	3	1	7	3	9	7	6	5	5	6	10	4	11
2	10	3	0	2	17	6	2	4	7	3	15	10	9	3	17	7
1	2	1	0	0	3	1	1	1	3	1	1	0	2	0	1	0
0	2	3	1	0	3	4	1	0	2	3	1	0	3	4	1	0
N	27	27	30	30	27	27	30	30	27	27	30	30	27	27	30	30





CONTINGENCY TABLE II  
FREQUENCY DISTRIBUTION OF SCORES OF GROUPS  
A, B, C, AND D ON FOUR NAMED VARIABLES

FIXED MODE

SCORES	COMPRE- HENSION				INTER- PRETATION				STRUCTURAL ACCURACY				CONTEXTUAL ACCURACY			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
10	0	0	1	0	0	0	4	1	0	0	0	0	0	0	1	0
9	0	1	6	1	0	1	2	0	0	1	1	0	0	0	1	0
8	0	0	6	1	0	0	5	0	0	0	2	0	0	1	1	0
7	1	1	5	4	0	1	3	2	0	1	1	1	0	1	1	1
6	5	4	7	7	2	4	9	6	1	4	1	4	2	3	3	3
5	1	6	2	9	2	2	0	8	2	4	3	4	5	3	1	6
4	8	7	0	4	4	5	3	5	12	8	5	9	6	9	3	7
3	3	4	1	2	7	4	1	2	2	4	4	5	6	4	4	6
2	4	0	1	1	8	7	0	4	6	3	12	6	4	4	13	6
1	2	3	0	1	0	1	2	2	1	1	0	1	1	1	1	1
0	3	1	1	0	4	2	1	0	3	1	1	0	3	1	1	0
N	27	27	30	30	27	27	30	30	27	27	30	30	27	27	30	30



Analysis of the data of Table IV aids in a fuller understanding of the features to be discussed, in relation to this further test of hypothesis I. Experimental Group A was familiar with the fixed mode, and consequently performed much better on the fixed than on the animated mode. Hence its significant mean differences on all four variables. The control groups - C and D - performed significantly better on the fixed mode than on the animated. This was due to the fact that since they were unfamiliar with both modes, they quite naturally, performed better on the easier mode.

Although Group B was familiar with the more difficult mode - the animated - it performed better on the easier fixed mode. Its mean differences on all four variables are not, however, significant, partly because the unfamiliar stimuli of the fixed mode share with Group B's familiar animated mode the common element of being visual. Therefore, the non-significant rather than significant differences for B's mean gains on all variables in the fixed mode over the animated may be accounted for by B's prior conditioning on a kindred visual medium - the animated.

Group A was the only group whose probability of  $t$  for differences between variances (Table II) was statistically significant between modes on 'interpretation'. The Group's probability of  $t$  for differences between means was clearly affected by this variation, for whereas its scores on the fixed medium showed a tendency to be normally distributed, its scores on the animated medium rose to a peak in the middle of the distribution (Contingency Tables 1 and 2,



Interpretation). This distribution and variation would still be consistent with the finding that one mode proved to be easier than another, when it is recalled that the Group's superior performance on the fixed over the animated mode was in part owing to the Group's familiarity with the easier mode (i.e. the fixed).

All other groups were unfamiliar with the fixed mode; but one of these - Group B - was familiar with a similar if more difficult mode, hence, B's non significant probability of t for differences between means. The level of significance of the probability of t (means) for the two groups unfamiliar with either mode merely served to emphasize that one mode was easier than another and that this was not a chance occurrence.

The differences in levels of significance found for individual groups on 'structural and contextual accuracy' are found, on examination, to be due to other factors over and above differences due to modal variation. When this variable is examined in each of its two component parts (Contingency Tables 1 and 2), it is seen that Group A had the bulk of its scores on 'contextual accuracy' (animated) between 2 and 4. Its scores on the same variable (fixed) centered between 3 and 5. When these scores were combined with their respective scores on 'structural accuracy', Group A's performance on the fixed mode in respect of this combined variable was significantly increased over its performance on the animated mode.





Similarly, Group C (control) showed a tendency to have better scores on contextual accuracy (fixed) than on contextual accuracy (animated). On the combined scores of structural and contextual accuracy, (Table IV), therefore, the difference between the modal means favored these two groups significantly on the fixed mode. Added to this, the order in which A and C saw the segmented and whole visual stimuli was different from the order in which B and D saw those same visual stimuli. This factor also seemed to have been operative in the differences of levels of significance for the inter-modal means of the individual groups.

'Overall', Contingency Tables I and II, and Table IV show that when scores for each group are examined separately and in relation to total scores for all groups (Table III), as well as in relation to modal differences, type of visual stimuli does affect pupils' scores. The analysis of data thus points to the total rejection of Hypothesis I.

## V. INTER-MODAL COMPARISON OF GROUP SCORES

### FOR EFFECTS OF FAMILIARITY WITH A MODE

The hypothesis was that familiarity with a given type of visual stimuli (fixed or animated) does not significantly affect pupils' scores on (a) comprehension, (b) interpretation, (c) structural and contextual accuracy, (d) overall. In general, this hypothesis was tested by noting the directional trend of differences in group scores which clearly indicated a group's familiarity or lack of familiarity with a given mode. The comparison of these



scores was effected by noting the differences in mean gains ( $\bar{D}_1 - \bar{D}_2$ ) between two groups at a time, a familiar group and an unfamiliar group. The resultant differences in mean gains between groups then helped to establish the pattern on which decisions concerning the hypothesis were made.

It has already been shown in Table IV that all four groups performed better on the fixed mode than on the animated mode. Closer examination of that Table showed that the magnitude of the inter-modal mean differences varied between and among groups. This variation can be shown to have assumed a distinctive pattern with regard to Group A's singular familiarity with the fixed mode in relation to each of the other three groups. For example, on 'comprehension' Group A's mean difference was .777, which in relation to the pattern mentioned, was greater than Group B's .407, but less than Group C's .867, and more than Group D's which was .533. All these gains favored the fixed mode.

Only Group A had been familiar with the fixed mode. Hence, its inter-modal mean gain favoring it on the fixed mode over the animated, and over Groups B and D would suggest that familiarity with the fixed mode was working to Group A's advantage. On the other hand, Group C, like Groups B and D, was unfamiliar with the fixed mode: yet this group had higher mean gains on all but one variable favoring it on the fixed mode over Group A. Furthermore, Group C was also favored by its gains over Group B on all but one variable on the fixed mode, and on all variables over Group D.



Examination of Tables V(a) and V(b) provides the key to a fuller appreciation of the significance of these comparisons. Table V(a) shows A's inter-modal mean gains favoring the fixed (familiar) mode in comparison with those of each group unfamiliar with this mode. Here it is seen that A's mean gains are all greater than B's, save with respect to 'structural and contextual accuracy, where the gains for both groups are identical. A's mean gains on the fixed mode are, without exception, greater than D's but less than C's, save with regard to 'structural and contextual accuracy, where A's gain was greater than C's.

A reason must therefore be found for C's demonstrated superiority over A on the relevant variables in A's own mode. In an attempt to find the answer for this seeming abnormality, Table V(b) shows the relationship of C's mean gains on the fixed mode - A's familiar medium - to those of the other two unfamiliar groups, B and D; and so provides the information necessary to understand the relationship between A and C on A's familiar mode.

Here it is seen that C was equally inferior to both A and B on 'structural and contextual accuracy', but superior on all other variables to A, B, and D. In addition, C's gain over B and D separately on each of 'comprehension', interpretation', and 'overall' is much greater than C's gain over A. Further, C's gain over D on 'structural and contextual accuracy' was greater than C's loss on this variable to each of A and B. It was shown in Table V(a), however, that the gains of A and B separately on 'structural



TABLE V(a)  
BETWEEN-GROUP COMPARISON OF INTER-MODAL MEAN  
GAINS IN RELATION TO A'S FAMILIARITY  
WITH THE FIXED MODE

Familiar Group	Unfamiliar Groups		Compre- hension	Inter- pretation	Structural and Contextual Accuracy	Overall
A	B	$\overline{D}_1 - \overline{D}_2$	.370	.445	0	.815
A	C	$\overline{D}_1 - \overline{D}_2$	-.090	-.115	.011	-.194
A	D	$\overline{D}_1 - \overline{D}_2$	.244	.252	.345	.841





TABLE V(b)  
INTER-MODAL MEAN GAINS OF GROUP C ON THE FIXED  
MODE IN ITS RELATION TO THE OTHER GROUPS

GROUPS		Compre- hension	Inter- pretation	Structural and Contextual Accuracy	Overall
C vs A	$\overline{D}_1 - \overline{D}_2$	.090	.115	-.011	.194
C vs B	$\overline{D}_1 - \overline{D}_2$	.460	.559	-.011	1.008
C vs D	$\overline{D}_1 - \overline{D}_2$	.334	.367	.334	1.035



and contextual accuracy' were in turn greater than the mean gains of C and D separately.

Since, therefore, with the exception of 'structural and contextual accuracy; the mean gains of C over A were in all other instances smaller than the mean gains of C over B, and C over D, it follows that C's smaller gain 'overall' over A must have been due to A's singular familiarity with the fixed mode. Consequently, the findings derived from the analysis of data of Tables V(a) and V(b) show that despite the incidence of other possible factors, Group A's showing on the fixed mode is relatively superior to that of each of the other three groups.

It was also evident that the effects of familiarity seemed to show up much more clearly in differences on the variable 'structural and contextual accuracy' than on any other variable. This variable was therefore seen to be the one most sensitive to the effects of familiarity or lack of familiarity with the visual conditioner.

Familiarity with a given type of visual stimuli did appear, therefore, to have affected pupils' scores on the four variables examined in the test of the hypothesis. The directional pattern of the findings, insofar as concerns Group A, points to the objection of the null hypothesis.

(ii) Group B was singularly familiar with the animated mode. The isolation of the effects of B's familiarity with this mode was arrived at by comparing inter-modally the relative gains of B and



each other group on the animated mode. First of all, B's intra-modal gains (on animated and fixed separately) in relation to those of each other group was noted (Table VI(a)). B's resultant gain on the fixed mode for each variable was then subtracted from its animated gain on the same variable. The difference of the differences for each pair of gains was then used to determine the extent of B's performance on its own mode over that of each other group unfamiliar with the animated mode (Table VI(b)).

The data relating to this partial test of the hypothesis are presented in Tables VI(a) and VI(b). Table VI(a) presents the following data: the mean differences ( $\bar{D}$ ) of B in comparison with each of the other three groups for both modes separately; an indication as to whether B's gain on the relevant mode was negative (-), or positive, as noted by the absence of the negative sign. Finally the Table gives the level of significance for the probability matrix of Scheffé's multiple comparison of means for each intra-modal comparison between B and the named unfamiliar group.

For the reader's convenience, an example is given below as to how Table VI(a) should be read. Reading from top left across, under columns 1 to 5, the analysis is as follows: B had positive gains on the variable of 'comprehension' over A in both modes. The gain on the animated mode was 1.111, and on the fixed .741. B was therefore favored over A on the animated mode.

The features pertinent to this continuing test of the hypothesis are presented explicitly but in lesser detail in Table





TABLE VI(a)

INTRA-MODAL COMPARISON OF MEAN DIFFERENCES BETWEEN  
GROUP B AND EACH OTHER GROUP ON THE ANIMATED  
AND THE FIXED MODES SEPARATELY

Familiar Group (animated)	Unfamiliar Groups	Modes		Compre- hension	Inter- pretation	S & C.A.	Overall
B	A	ANIMATED	$\bar{D}_1$	1.111	1.259	1.667	4.037
		FIXED	$\bar{D}_2$	.741	.815	1.667	3.222
B	C	ANIMATED	$\bar{D}_1$	-2.156*	-2.148*	.756	-3.548
		FIXED	$\bar{D}_2$	-2.615*	-2.707*	.767	-4.556
B	D	ANIMATED	$\bar{D}_1$	-.922	-.748	.022	-1.648
		FIXED	$\bar{D}_2$	-1.048	-.941	.367	-1.622

\* Significant at or beyond the .01 level



VI(b). Here, the mean gain of Group B in comparison with each of the other three groups, on inter-modal comparisons, is given for each variable to be examined. From this, the effects of familiarity with the animated mode on B's gains can be more easily isolated.

B's gains on this mode over A are all positive, save on 'structural and contextual accuracy', where the gains for both groups are identical. B's gains on the animated mode, in relation to each of C and D, are negative for 'comprehension' and interpretation' but positive on 'structural and contextual accuracy'. This apparent anomaly significantly affected the 'overall' gain (animated) of B over D, but not of B in relation to C. An explanation must therefore be found for this irregularity.

Closer examination of Table VI(b) shows that on the animated mode B was undoubtedly superior to Group A, save on 'structural and contextual accuracy', where both groups had identical gains. On the other hand, B's familiarity with the animated mode enabled it apparently to do better than Groups C and D on 'structural and contextual accuracy' though not on 'comprehension' and 'interpretation' in that mode. However, B's gain on 'structural and contextual accuracy' (animated) over C was small ( .011), whereas its gain on the same variable over D was inordinately large ( .345).

The result of this was that 'overall' B had a slight positive gain on the animated over D, but not over C, since C's general superiority over B was in no way diminished by B's only slightly



TABLE VI(b)

BETWEEN-GROUP COMPARISON OF INTER-MODAL MEAN  
GAINS IN RELATION TO B'S FAMILIARITY  
WITH THE ANIMATED MODE

Familiar Group	Unfamiliar Groups		Compre- hension	Inter- pretation	Structural and Contextual Accuracy	Overall
B	A	$\bar{D}_1 - \bar{D}_2$	.370	.445	0	.815
B	C	$\bar{D}_1 - \bar{D}_2$	-.460	-.559	.011	-1.008
B	D	$\bar{D}_1 - \bar{D}_2$	-.126	-.193	.345	.026



better performance on 'structural and contextual accuracy' on the animated mode over C, Group B's overall gains on the animated mode relative to C, therefore, remained negative.

C performed better than B on all other variables but 'structural and contextual accuracy' in both modes. Consequently, B's gains in relation to C's on the animated mode must have been due to an intrinsic factor favoring B. Since B's gains were singular in favoring the more difficult animated mode over the easier (fixed) mode that 'intrinsic factor' could only have been B's unique familiarity with the difficult mode.

On a straight comparison of scores, D did better than B on all variables save 'structural and contextual accuracy' in both modes. When these scores are compared for the effects of B's familiarity with the animated mode, however, the mean gain is seen to favor B only slightly over D 'overall' but very significantly over D on 'structural and contextual accuracy'. Thus, B is seen to have performed slightly better on its own mode over D than on the unfamiliar fixed mode.

Conversely, A's demonstrated inferiority to all other groups was evident in its scores on all variables in both modes (Table II). However, its performance in comparison with each other group showed it to be relatively superior on its own mode - the fixed. But when it was compared with Group B, the effects of its unfamiliarity with the animated mode were easily isolated in a direct comparison. By the same token, the effects of B's famil-





ilarity with the animated, and unfamiliarity with the fixed, were positively ascertained in direct comparisons with A. It was of interest to note that their reciprocal familiarity or lack of familiarity with each of the two modes resulted in a zero (0) difference on 'structural and contextual accuracy, which thus emphasized the more vividly the effect of familiarity on performance.

Examination of Table VII reveals that in comparison with Group A, D's performance on the animated mode always resulted in positive gains over the fixed mode. In comparison with Group C, D also performed relatively better on the animated over the fixed mode, even though the gains were all negative. The fact that both B and D separately performed better on the animated mode over the fixed than A and C separately, suggests the presence of another factor over and above that of familiarity or unfamiliarity with the animated mode.

It was seen from Table VI(b) that the differences between B and D's scores on 'comprehension' and 'interpretation' were in every instance smaller than those between the corresponding scores of B versus A, and B versus C. On the other hand, the mean gain of B on 'structural and contextual accuracy' (animated) over D was very much larger than the mean gain on the same variable of B versus A (gain identical), and B versus C. Consequently, B's 'overall' gain on the animated variable over D was considerably smaller than B's gain over A, and only slightly larger than B's gain in relation to C.



TABLE VII  
INTER-MODAL MEAN GAINS OF GROUP D ON THE  
ANIMATED MODE IN ITS RELATION  
TO THE OTHER GROUPS

GROUPS		Compre- hension	Inter- pretation	Structural and Contextual Accuracy	Overall
D vs A	$\overline{D}_1 - \overline{D}_2$	.244	.252	.345	.841
D vs B	$\overline{D}_1 - \overline{D}_2$	.126	.193	-.345	-.026
D vs C	$\overline{D}_1 - \overline{D}_2$	-.334	-.367	-.334	-1.035



This small gain of B on its own familiar mode over D in relation to the gain of B versus A and B versus C is an exogenous feature peculiar to B's performance alone in the animated mode. It must, therefore, be attributed to B's singular familiarity with that mode. Once again, as with Group A, 'structural and contextual accuracy' seemed to be the variable most sensitive to the effects of familiarity. It was the variable which exercised greatest discrimination between B's gains on the animated mode (overall) in relation to the unfamiliar groups.

The foregoing analysis of the data exhibits a tendency that points to a possible rejection of the hypothesis. Familiarity does seem to affect pupils' scores on the variables examined.

#### VI. COMPARISON OF GROUP SCORES IN RELATION TO ORDER OF PRESENTATION OF THE VISUAL STIMULI

The hypothesis stated that the order of presentation of the visual stimuli (fixed or animated) does not significantly affect pupils' scores on (a) comprehension, (b) interpretation, (c) structural and contextual accuracy, (d) overall.

Table I(b) showed that the visual stimuli were presented in three separate parts to the four groups involved in the study. These groups were divided in such a manner that each pair included an experimental and a control group; and the order of viewing the visual stimuli was different for each pair. Table VIII(a) simplifies





the features to be discussed.

On examination of Table VIII(a), it is seen that Group A (familiar with the fixed mode) and Group C (control) had the same order of viewing. Group B (familiar with the animated mode) and Group D (control) had an order of viewing that was the reverse of A and C's. The visual conditioners which comprised the testing instruments for both segmented and whole viewings were the same.

In Part I the Ss were made to respond after only one viewing of each of the concepts in segmented form. In Parts II and III, whole viewing was presented thrice for each concept before the Ss were made to respond. It is to be noted, too, that in each of Parts II and III both concepts of each mode were shown. In Part I, although both concepts were used, only one concept of each mode was shown to any given pair of groups.

The hypothesis being tested here is concerned only with the effects of order of presentation on the scores of the four groups in Parts II and III. This is so because the functions of Parts II and III, which are similar, differ from the function of Part I. Parts II and III sought to have the Ss narrate the stories told by the visuals in each of concepts 1 and 2. The function of Part I was (i) to discover whether the Ss were able to comprehend and interpret the visual stimuli in segmented form outside of a narrative context; and (ii) to see how well the performance of the Ss on the segmented visuals, irrespective of mode or concept, would correlate with their subsequent performance on 'comprehension' and



TABLE VIII(a)

ORDER OF PRESENTATION OF VISUAL STIMULI FOR GROUPED PAIRS  
(EXPERIMENTAL AND CONTROL)

Experimental Groups	Control Groups	PART I	PART II	PART III
Familiar with named mode only	Unfamiliar with either mode	Segmented viewing	Whole viewing	Whole viewing
A  (FIXED)	C	Concept 1 (Fixed)	Concept 1 (Animated)	Concept 1 (Fixed)
		Concept 2 (Animated)	Concept 2 (Animated)	Concept 2 (Fixed)
B  (ANIMATED)	D	Concept 1 (Animated)	Concept 1 (Fixed)	Concept 1 (Animated)
		Concept 2 (Fixed)	Concept 2 (Fixed)	Concept 2 (Animated)



'interpretation' in Parts II and III.

However, since the full effect of this previous viewing in segmented form on subsequent performance in Parts II and III is not known, an examination will be made to discover the operative influence of such an effect. This will be examined in the concluding interpretations on Hypotheses III, IV, and V in the final Chapter. The analysis of data proper of the present Chapter deals only with order of presentation as it relates to the scores of the groups in Parts II and III of Table VIII(a).

Tables VIII(b), IX, and X present the data that were used to test this hypothesis. Table VIII(b) gives a comprehensive picture of the scores of each of Groups A to D in relation to the order in which each group saw the visual stimuli. Thus, on whole viewing, Groups A and C saw the animated visual stimuli followed by the fixed. Groups B and D saw the fixed followed by the animated. The numbers (1, 2) in the 'order' column denote whether the named mode was taken first or last by the group in question. A positive mean difference on any given variable indicates that the group within that cell had a positive mean gain on the visual stimuli it saw last. A negative sign indicates that the group within the cell had a negative mean gain on the mode it took last. The subscript gives an indication as to whether the group was experimental<sub>(i)</sub>, or control<sub>(o)</sub>; and an  $\alpha_{(cc)}$  denotes the level of significance for the difference between means.

From an inspection of Table VIII(b), it will be seen that



TABLE VIII(b)

INTER-MODAL COMPARISON OF GROUP MEANS IN RELATION  
TO ORDER OF PRESENTATION

Group	Mode	Order of Viewing		Compre- hension	Inter- pretation	Structural and Contextual Accuracy	Overall
A (i)	ANIMATED		$\bar{X}$	2.6667	1.9259	5.2222	9.8148
	FIXED		$\bar{X}$	3.4444	2.7778	6.3333	12.5556
			$\bar{D}$	0.7777	0.8519	1.1111	2.7408
		1	$\infty$	*	*	**	*
	FIXED		$\bar{X}$	4.1852	3.5926	8.0000	15.7778
	ANIMATED		$\bar{X}$	3.7778	3.1852	6.8889	13.8519
B (i)			$\bar{D}$	-.4074	-.4074	-1.1111	-1.9259
		2	$\infty$	N.S.	N.S.	N.S.	N.S.
	ANIMATED		$\bar{X}$	5.93333	5.3333	6.1333	17.4000
	FIXED		$\bar{X}$	6.8000	6.3000	7.2333	20.3333
			$\bar{D}$	0.8667	0.9667	1.1000	2.9333
		1	$\infty$	*	**	*	*
C (o)	FIXED		$\bar{X}$	5.2333	4.5333	7.6333	17.4000
	ANIMATED		$\bar{X}$	4.7000	3.9333	6.8667	15.5000
			$\bar{D}$	-.5333	-.6000	-.7666	-1.9000
		2	$\infty$	*	**	N.S.	*
	FIXED		$\bar{X}$	5.2333	4.5333	7.6333	17.4000
	ANIMATED		$\bar{X}$	4.7000	3.9333	6.8667	15.5000
D (o)			$\bar{D}$	-.5333	-.6000	-.7666	-1.9000
		2	$\infty$	*	**	N.S.	*
	FIXED		$\bar{X}$	5.2333	4.5333	7.6333	17.4000
	ANIMATED		$\bar{X}$	4.7000	3.9333	6.8667	15.5000
			$\bar{D}$	-.5333	-.6000	-.7666	-1.9000
		2	$\infty$	*	**	N.S.	*

1 Viewed film followed by filmstrip.

2 Viewed filmstrip followed by film.

\* Significant at or beyond the .01 level.

\*\* Significant at or beyond the .05 level.

(i) (Experimental Group)

(o) (Control Group)

N.S. Not significant.





the inter-modal mean differences bear a systematic ordered relationship between groups to the order in which the visual stimuli were presented. The levels of significance noted for each group in respect of differences between means on each variable are also consistent with this systematic notation.

Table IX summarizes symbolically the comparison of mean gains between groups in relation to order of presentation. Thus, A, B, (and the like), denotes that the named group gained more than the other group in the cell on the mode that each group had last.

Using a Newman-Keuls comparison between ordered means and the probability matrix for Scheffe's multiple comparison of means, Table X shows the results obtained from comparing the differences between group means two at a time, following an F test, on each independent variable in the animated and in the fixed mode. For each pair of groups compared, Table X provides the following: names of the groups being compared, and the order in which each saw the visual stimuli; an indication as to which group was favored by the mean difference on each mode regardless of order of presentation; the level of significance for the probability matrix of each such mean difference on each variable; and the difference of the mean differences between the two modes  $(\bar{D}_1 - \bar{D}_2)$ .

Following the numeration for the difference of the differences  $(\bar{D}_1 - \bar{D}_2)$ , the positive sign (+) signifies that the first named group performed better, whether relatively or in direct com-



TABLE IX  
COMPARISON OF INTER-MODAL MEAN GAINS BETWEEN  
GROUPS IN RELATION TO ORDER  
OF PRESENTATION

GROUPS	Comprehension	Interpretation	Structural and Contextual Accuracy	Overall
A vs B	A	A	A	A
A vs C	C	C	A	C
A vs D	A	A	A	A
B vs C	C	C	C	C
B vs D	B	B	D	D
C vs D	C	C	C	C
AC vs BD	AC	AC	BD	AC

NOTE: The listed group always has the positive gain on the mode it  
took last in relation to the group with which it is being compared.



TABLE X  
INTRA-MODAL COMPARISON OF GROUP MEANS TWO AT A TIME,  
FOLLOWING AN F TEST, AND COMPARISON OF  
INTER-MODAL MEAN GAINS IN RELATION  
TO ORDER OF PRESENTATION

Order Code for Groups	Mode		Compre- hension	✂	Inter- pretation	✂	Structural and Contextual Accuracy	∞	Overall	∞
A 1 B 2	ANIMATED	$\overline{D}_1$	B	N.S.	B	N.S.	B	N.S.	B	N.S.
	FIXED	$\overline{D}_2$	B	N.S.	B	N.S.	B	N.S.	B	N.S.
		$\overline{D}_1 - \overline{D}_2$	+		+		=		+	
A 1 C 1	ANIMATED	$\overline{D}_1$	C	*	C	*	C	N.S.	C	*
	FIXED	$\overline{D}_2$	C	*	C	*	C	N.S.	C	*
		$\overline{D}_1 - \overline{D}_2$	++		++		+		++	
A 1 D 2	ANIMATED	$\overline{D}_1$	D	*	D	*	D	N.S.	D	*
	FIXED	$\overline{D}_2$	D	*	D	*	D	N.S.	D	*
		$\overline{D}_1 - \overline{D}_2$	+		+		+		+	

1 Viewed animated followed by fixed.  
2 Viewed fixed followed by animated.  
  
A,B,C,D - The listed group is favored by the intra-modal mean difference.

(contd.)





TABLE X (contd.)

Order Code for Groups	Mode		Compre- hension		Inter- pretation		Structural and Contextual Accuracy		Overall	
B 2 C 1	ANIMATED	$\overline{D}_1$	C	*	C	*	B	N.S.	C	N.S.
	FIXED	$\overline{D}_2$	C	*	C	*	B	N.S.	C	N.S.
		$\overline{D}_1 - \overline{D}_2$	++		++		++		++	
B 2 D 2	ANIMATED	$\overline{D}_1$	D	N.S.	D	N.S.	B	N.S.	D	N.S.
	FIXED	$\overline{D}_2$	D	N.S.	D	N.S.	B	N.S.	D	N.S.
		$\overline{D}_1 - \overline{D}_2$	-		-		--		+	
C 1 D 2	ANIMATED	$\overline{D}_1$	C	N.S.	C	*	D	N.S.	C	N.S.
	FIXED	$\overline{D}_2$	D	*	C	*	D	N.S.	C	N.S.
		$\overline{D}_1 - \overline{D}_2$	+		+		++		+	

+ First named group has positive mean gain on the mode taken last.

++ Second named group has positive mean gain on the mode taken last.

(contd.)



TABLE X (contd.)

Order Code for Groups	Mode	Structural and Contextual Accuracy							
		Compre- hension	Inter- pretation	Overall					
AC 1									
BD 2									
	ANIMATED	$\bar{D}_1$	AC	N.S.	AC	N.S.	BD	N.S.	BD
	FIXED	$\bar{D}_2$	AC	N.S.	AC	N.S.	BD	N.S.	AC
		$\bar{D}_1 - \bar{D}_2$	+		+		++		+

- First named group has negative mean gain on the mode taken last.

-- Second named group has negative mean gain on the mode taken last.

N.S. Not significant

\* Significant at or beyond the .01 level.



parison with the other group, on the mode taken last. A negative sign (-) indicates that the first named group had a negative mean gain on the mode it took last. A double positive signifies that the second group of a pair had a positive mean gain on the mode taken last, while a double negative (--) suggests that the second named group of a pair had a negative mean gain on the mode it took last.

Scrutiny of Table X shows that the intra-modal mean differences between the two experimental groups (A and B) are not significant in either mode. Two reasons are advanced for this. Firstly, each was familiar with one or other of the two modes. Hence, the effects of different orders of presentation did not significantly affect mean differences between the scores of the two groups. Secondly, the groups were each unfamiliar with the other's mode. Therefore, the significant effects that might have accrued from a difference in order of presentation were apparently lessened, or totally obscured. The net result of this was that each group was seen to be favored by the mean gains on its own mode, which was also the mode taken last.

Thus, in spite of the actual scores which favored B over A in both modes, A still performed relatively better on the mode taken last (i.e. the fixed), which was also its own mode, than did B on the identical mode. The direct opposite was true of B on its own mode (the animated) over A.

The differences noted between A and C were significant for



all intra-modal comparisons, save those of 'structural and contextual accuracy' (fixed and animated). Both these groups had the same order of presentation of the visual stimuli: yet C commanded higher scores than A on all variables in both modes. However, A was always favored on its own mode, which it saw last, in relation to C. At the same time, C was always favored on the fixed mode over the animated, although it was familiar with neither mode. But since the fixed mode has already been shown to be the easier, it follows that being unfamiliar with either mode C's gains over A on the fixed mode must also be attributed to causes other than the facility of the mode. Careful analysis of the data shows these causes to be (i) A's previously-demonstrated inferiority to C (see Table II, p. 76) and (ii) a favorable order of presentation, which worked to C's advantage over A.

In contrast to the relationship of scores between A and C, that of A and D is interesting. Both these groups had different orders of presentation. D's scores were all higher than A's; but the mean gains favoring A on the fixed mode over D were all higher than the mean gains of A in relation to C on the fixed mode. The easier order of presentation in combination with A's familiarity with the fixed mode afforded A a slight advantage in relation to C on the fixed mode. On the other hand, A's gains on the fixed in relation to D were increased by virtue of D having had the more difficult order of presentation. D, like C, was not familiar with either mode. The result was that D was therefore at a double dis-





advantage to A in respect of the easier fixed mode which D saw first, but A saw last.

When the gains on the animated mode are examined, it is seen that D was favored on this mode over A. Since both A and D were unfamiliar with this mode, it follows that D's gains over A were greatly influenced by a favorable order of presentation in respect of the animated mode. These favorable gains notwithstanding, because of D's unfamiliarity with the animated mode, its gains over A were not as high as those of B over A. This is understandable when it is remembered that B was singularly familiar with the animated mode. The combined operative influences of all these factors, inclusive of order of presentation, would therefore account for the significant differences noted for the intra-modal comparisons between A and D.

The process of inferential deduction employed above can be used to account for each of the remaining pairs of comparisons. Overall, the results showed that scores were in fact affected, however slightly, by differences in the order of presentation. At the same time, the results show that the order - animated followed by fixed had the advantage over the alternate order - fixed followed by animated.

It was not within the scope of the statistical design of this study to examine the full effect of order of presentation on the combined groups AC versus BD. However, a very superficial examination of the data revealed that the pattern suggested findings



similar to those found for comparison of two groups at a time.

The analyses of data for hypotheses III all point to a rejection of the null hypothesis. Order of presentation did seem to affect scores.

#### VII. INTRA-MODAL AND INTER-MODAL COMPARISONS OF SCORES BETWEEN CONCEPT 1 AND CONCEPT 2

The hypothesis stated that there is no significant difference between scores on concept 1 and concept 2 on either of the variables - comprehension or interpretation, - in either the fixed or the animated medium. This hypothesis was tested (i) by comparing the total group's comprehension scores on concept 1 (animated) with the total group's comprehension scores on concept 2 (animated) - Table XI; (ii) by comparing the above mentioned scores for each of the four groups in the same manner as that outlined for total group - Table XII; (iii) by comparing the interpretation scores for total group and individual groups as was done for 'comprehension' - Tables XI and XII respectively; (iv) by comparing the fixed scores on the relevant variables as was done for comprehension and interpretation (animated) for total group (Table XI) and individual groups (Table XII). The foregoing data were used for intra-modal comparisons.

The further test of the hypothesis compared inter-modally each of concepts 1 and 2 for total and individual groups - Tables XIII and XIV respectively.

Tables XI and XII provide the following for total and in-



dividual groups: mean on each mode for the relevant variables, mean differences, and probability of  $t$  for mean differences. The positive sign (+) indicates a higher score for concept 1, and the negative sign (-) a higher score for concept 2. All mean differences in Table XI favored concept 2; and all but three favored concept 2 in Table XII. The analysis of data in Table XI, therefore, indicates a rejection of the null hypothesis in every instance.

#### VII. (a) INTRA-MODAL COMPARISONS OF CONCEPTS 1 and 2

##### (i) Comprehension (Animated)

Table XI, column 3, shows a mean difference whose probability of  $t$  is significant for the total group between concepts 1 and 2. Examination of Table XII revealed that this difference was influenced by B's singular familiarity with the animated mode. This familiarity resulted in a mean difference between concepts that was highly significant (.000) for Group B alone of all the groups. No significant difference was noted for any of the other three groups. The following explanation serves to account for B's singular significant mean difference in this regard.

The group was familiar with this mode. Yet its performance on the first concept in its own medium was not very good - a mean of 1.556 (Table XII). On the second concept, however, the mean was 2.222. The difference between the means of both concepts for the total group favored the second concept, which was therefore adjudged to be the easier. Group B had previously seen the visual stimuli of concept 2 in segmented sections in the fixed mode. Therefore,





TABLE XI

INTRA-MODAL COMPARISON OF COMPREHENSION AND INTER-  
 PRETATION SCORES BETWEEN CONCEPTS 1 AND 2  
 (a) ANIMATED; (b) FIXED FOR TOTAL GROUP

ANIMATED MODE			FIXED MODE		
Concept		Compre- hension	Inter- pretation	Compre- hension	Inter- pretation
1	$\bar{X}$	2.026	1.737	2.325	2.061
2	$\bar{X}$	2.298	1.912	2.649	2.298
	$\bar{D}$	-0.272	-0.175	-0.324	-0.237
	P of t means	.002	.030	.000	.008

- Mean differences favor Concept 2.



when it saw the same concept as a whole in its own medium, it performed significantly better on it than on the more difficult concept 1, which it had seen before in its own mode in segmented form. Concept 2 provided for Group B, then, the double advantage of an easier concept and a singularly familiar mode.

Even though no significant differences were noted for any of the other individual groups, the differences between conceptual means were significant for the total group, and so the null hypothesis is rejected for this variable.

(ii) Interpretation (Animated)

The mean difference was significant at the .05 level for the total group, and at the .01 level for Group B. All other mean differences were not significant. Examining the mean differences between concepts for each group, it is readily seen that Group B had higher gains on concept 2 over concept 1 than any other group (Table XII). This significant difference in gains is due to the fact that B performed comparatively better on the easier concept in its own mode than the other groups performed on an easier concept in an unfamiliar mode.

(iii) Comprehension (Fixed)

A significant difference was found between the means of the two concepts for total group. No significant difference was found in the case of either control group. Both Groups A and B, had significant differences on this variable.



Group A was familiar with this mode. In addition, even though the Group had had previously the advantage of seeing concept 1 (fixed), it still did better on concept 2, which it had viewed segmentally in the more difficult mode. Concept 2 must therefore have been easier to comprehend than concept 1. Consequently, the facility of concept 2, coupled with A's familiarity with the fixed mode accounted for its significantly better performance on concept 2.

Group B had seen concept 2 (fixed) in segmented form before. Therefore, this previous viewing plus the concept's relative facility in the easier mode would account, in part, for B's significant difference. Added to this, B was already familiar with a kindred visual mode - the animated. Since Groups C and D had no familiarity with either mode, they quite naturally performed better on the easier concept in the easier mode, but showed no significant difference between means.

The rejection of the null hypothesis on this variable was thus well supported.

(iv) Interpretation (Fixed)

Significant differences were found for total group and for Group A. All other groups had non-significant differences. Group A had a mean gain of 0.630 on concept 2 over concept 1 (fixed). Corresponding gains for the other groups were for each of B, C, and D respectively 0.185, 0.100, and 0.267. This large difference for Group A must be attributed to superior performance on the



TABLE XII

INTRAMODAL COMPARISON OF COMPREHENSION AND INTERPRETATION  
SCORES BETWEEN CONCEPTS 1 AND 2 (a) ANIMATED;  
(b) FIXED, FOR INDIVIDUAL GROUPS

ANIMATED MODE			FIXED MODE			
Group	Concept		Compre- hension	Inter- pretation	Compre- hension	Inter- pretation
A	1	$\bar{X}$	1.185	0.963	1.333	1.074
	2	$\bar{X}$	1.481	0.963	2.111	1.704
		$\bar{D}$	-.296	0	-.778	-.630
		P of t means	.133	1.000	.000	.002
B	1	$\bar{X}$	1.556	1.407	1.889	1.704
	2	$\bar{X}$	2.222	1.778	2.296	1.889
		$\bar{D}$	-.666	-.371	-.407	-.185
		P of t means	.000	.010	.009	.232
C	1	$\bar{X}$	2.900	2.600	3.467	3.200
	2	$\bar{X}$	3.033	2.733	3.333	3.100
		$\bar{D}$	-.133	-.133	+.134	+.100
		P of t means	.442	.502	.354	.522
D	1	$\bar{X}$	2.333	1.867	2.467	2.133
	2	$\bar{X}$	2.367	2.067	2.767	2.400
		$\bar{D}$	-.034	-.200	-.300	-.267
		P of t means	.823	.297	.095	.174

+ Mean difference ( $\bar{D}$ ) favors Concept 1.  
- Mean difference ( $\bar{D}$ ) favors Concept 2.





easier concept in the easier mode, with which the Group was singularly familiar.

The evidence is thus abundantly clear that concept 2 was the easier concept in both modes, over and above any other operative factors. The null hypothesis is therefore rejected on the basis of the evidence presented in Tables XI and XII. A summary of the results of Tables XI and XII follows:

#### SUMMARY OF RESULTS OF TABLES XI & XII

(Intra-modal comparison)

##### (a) Comparison of concepts 1 & 2 comprehension (animated):

	P of t for mean differences	Significance Level
Total Group	.002	Significant.
Group A	.133	Not significant.
Group B	.000	Significant.
Group C	.442	Not significant.
Group D	.823	Not significant.

##### (b) Comparison of concepts 1 & 2 interpretation (animated):

Total Group	.030	Significant.
Group A	1.000	Not significant.
Group B	.010	Significant.
Group C	.502	Not significant.
Group D	.297	Not significant.



(c) Comparison of concepts 1 & 2 comprehension (fixed):

	P of t for mean differences	Significance Level
Total Group	.000	Significant.
Group A	.000	Significant.
Group B	.009	Significant.
Group C	.354	Not significant.
Group D	.095	Not significant.

(d) Comparison of concepts 1 & 2 interpretation (fixed):

Total Group	.008	Significant.
Group A	.002	Significant
Group B	.232	Not significant.
Group C	.522	Not significant.
Group D	.174	Not significant.

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## VII. (b) INTER-MODAL COMPARISONS OF CONCEPTS 1 AND 2

Tables XIII and XIV provide the analysis of data for the inter-modal comparisons of each of concepts 1 and 2 for total and individual groups. The following are given for each set of comparisons: mean for each mode on each concept, mean differences and probability of t for mean differences.

Both concepts 1 and 2 were favored on the fixed over the animated mode; at no time did a mean difference favor the concept on the animated mode. This overwhelming trend in favor of the



fixed over the animated mode pointed to the rejection of the null hypothesis in respect of the inter-modal conceptual comparisons.

(i) Concept 1 (Comprehension):

On this comparison, there were significant differences for total group (Table XIII) and for Group C, control, (Table XIV). It appears from analysis of the data that Group C's performance on Concept 1 (fixed) may have been greatly influenced by the Group's previous viewing of that concept in segmented form in the fixed medium. Group C's mean difference favoring this concept was much greater than that of any other group, inclusive of Group A, which had the fixed mode as its familiar medium.

(ii) Concept 1 (Interpretation):

The probability of  $t$  for mean differences was significant both for the total group and for Group C. Group C had seen this concept previously in segmented form in the easier mode. Therefore, when it viewed the same concept a second time (whole), its mean gain was significantly increased over that of the other groups.

(iii) Concept 2 (Comprehension):

Mean difference for total group was significant here, with a probability of  $t$  of .000 (Table XIII, column 6). The significant differences noted for both Groups A and D seemed to have accounted for the significant  $p$  of  $t$  (means) for total group. Group A performed relatively better on this concept in the easier mode with which it was familiar than any other group. Group D had viewed





TABLE XIII  
 INTER-MODAL COMPARISON OF (a) CONCEPT 1;  
 (b) CONCEPT 2, FOR TOTAL GROUP

CONCEPT 1			CONCEPT 2		
Mode		Compre- hension	Inter- pretation	Compre- hension	Inter- pretation
Animated	$\bar{X}$	2.026	1.737	2.298	1.919
Fixed	$\bar{X}$	2.325	2.061	2.649	2.298
	$\bar{D}$	-0.299	-0.324	-0.351	-0.386
	P of t means	.001	.000	.000	.000

- Mean difference ( $\bar{D}$ ) favors Concept on the fixed mode.



TABLE XIV  
INTER-MODAL COMPARISON OF (a) CONCEPT 1;  
(b) CONCEPT 2 FOR INDIVIDUAL GROUPS

CONCEPT 1			CONCEPT 2			
Group	Mode		Compre- hension	Inter- pretation	Compre- hension	Inter- pretation
A	Animated	$\bar{X}$	1.185	0.963	1.481	0.963
	Fixed	$\bar{X}$	1.333	1.074	2.111	1.704
		$\bar{D}$	-0.148	-0.111	-0.630	-0.741
		P of t means	.460	.449	.000	.000
B	Animated	$\bar{X}$	1.556	1.407	2.222	1.778
	Fixed	$\bar{X}$	1.889	1.704	2.296	1.889
		$\bar{D}$	-0.333	-0.297	-0.074	-0.111
		P of t means	.059	.058	.739	.600
C	Animated	$\bar{X}$	2.900	2.600	3.033	2.733
	Fixed	$\bar{X}$	3.467	3.200	3.333	3.100
		$\bar{D}$	-0.567	-0.600	-0.300	-0.367
		P of t means	.002	.008	.130	.094
D	Animated	$\bar{X}$	2.333	1.867	2.367	2.067
	Fixed	$\bar{X}$	2.467	2.133	2.767	2.400
		$\bar{D}$	-0.134	-0.266	-0.400	-0.333
		P of t means	.293	.133	.001	.067

- Mean difference ( $\bar{D}$ ) favors Concept on the fixed mode.



concept 2 previously in the easier mode. Not being familiar with either mode, the Group did better on the easier mode on which it had had the previous segmented viewing.

(iv) Concept 2 (Interpretation):

Group A's probability of t for differences between means was the only one significant for individual groups (0.000). Its superior mean gain over that of each of the other groups on concept 2 of its own familiar mode (easier both modally and conceptually) seemed to have influenced the significant probability of t for differences between the means of the total group.

The foregoing analyses of the data should serve to indicate why Hypothesis IV was rejected in its entirety. A summary of the results of Tables XIII and XIV follows:

SUMMARY OF RESULTS OF TABLES XIII & XIV

(Inter-modal comparison of Concepts  
1 and 2)

(a) Concept 1 (Comprehension):

	P of t for mean differences	Significance Level
Total Group	.001	Significant.
Group A	.460	Not significant.
Group B	.059	Not significant.
Group C	.002	Significant
Group D	.293	Not significant.



(b) Concept 1 (Interpretation):

	P of t for mean differences	Significance Level
Total Group	.000	Significant.
Group A	.449	Not significant.
Group B	.058	Not significant.
Group C	.008	Significant.
Group D	.133	Not significant.

(c) Concept 2 (Comprehension):

Total Group	.000	Significant.
Group A	.002	Significant.
Group B	.739	Not significant.
Group C	.130	Not significant.
Group D	.001	Significant.

(d) Concept 2 (Interpretation):

Total Group	.000	Significant.
Group A	.000	Significant.
Group B	.600	Not significant.
Group C	.094	Not significant.
Group D	.067	Not significant.

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### VIII. CORRELATIONS BETWEEN SCORES ON SEGMENTED AND WHOLE VIEWING

The hypothesis tested here stated that the comprehension and interpretation scores on a given concept viewed segmentally in either medium cannot significantly predict the comprehension and interpretation scores on that concept viewed as a whole in either medium. Two different sets of data analyses were used to test this hypothesis. In the first set, the scores of Group A (Table XV) and Group C (Table XVI) were used. In the second set, the scores of Group B (Table XVII) and Group D (Table XVIII) were used.

This method of testing the hypothesis was used because all four groups did not view segmentally identical concepts in the same media. Groups A and C saw segmentally concept 1 (fixed) and concept 2 (animated). Groups B and D viewed segmentally concept 1 (animated) and concept 2 (fixed). Each Table shows a given Group's correlation between the segmented scores of PART I with the whole scores of each of PARTS II and III on (Concept 1), 'comprehension' and 'interpretation'. It also shows a given Group's correlation between the segmented scores of PART I with the whole scores of each of PARTS II and III on 'comprehension' and 'interpretation' (Concept 2). An indication is also given as to the mode or modes involved in each pair of correlations. The percentage of the variances and level of significance for the correlation coefficients complete the information given in Tables XV to XVIII.



On concept 1 (Table XV) Group A's correlations for 'comprehension' were respectively .45 and .07 for Part I with Part II, and Part I with Part III. The Group's correlations on 'interpretation' for concept 1 were, for Part I with Part II, .43, and for Part I with Part III, .29.

Concept 2 segmented (animated) correlated at .41 with the corresponding variable of 'comprehension' (animated) whole, Part II, and at .55 with 'comprehension' (fixed) whole, Part III. The mean 'interpretation' score on concept 2 segmented (animated) correlated with the corresponding whole score (animated) at .04, and with the corresponding whole score (fixed) at .21. Overall, four of the correlations were significant and four were not significant. Table XVI is read in similar fashion for Group C.

The correlated scores for Group B are shown in Table XVII. The respective correlations between concept 1 segmented (animated) with concept 1 (fixed) whole, and concept 1 (animated) whole were, for 'comprehension', .00 and .03; and for 'interpretation' .01 and .06.

Correlations of concept 2 segmented (fixed), comprehension, with Part II and Part III respectively were .08 and .05. 'Interpretation' segmented, concept 2 (fixed) correlated at .17 with concept 2 whole (fixed), and at 0.00 with concept 2 whole (animated). It is clear from this information that Group B's correlations were all very low and not significantly different from zero, save in two instances where the absence of a relation was noted.



TABLE XV  
CORRELATIONS OF SEGMENTED WITH WHOLE SCORES  
FOR GROUP A

Correlation of Part I, segmented, (a) -(fixed), (b) (ani- mated) with Part II whole (animated), and Part III whole (fixed).			
(a)	CONCEPT 1	PART II (Whole) (ANIMATED)	PART III (Whole) (FIXED)
COMPRE- HENSION	PART I, SEGMENTED (FIXED)	0.45	0.07
	% of variance	20.00	0.49
	$\alpha$	0.02	N.S.
	CONCEPT 1		
INTER- PRETATION	PART I, SEGMENTED (FIXED)	0.43	0.29
	% of variance	18.00	8.00
	$\alpha$	0.02	N.S
	CONCEPT 2		
(b)	PART I, SEGMENTED (ANIMATED)	0.41	0.55
	% of variance	16.00	30.00
	$\alpha$	0.05	0.01
	CONCEPT 2		
COMPRE- HENSION	PART I, SEGMENTED (ANIMATED)	0.04	0.21
	% of variance	0.16	4.00
	$\alpha$	N.S.	N.S.
INTER- PRETATION	PART I, SEGMENTED (ANIMATED)	0.04	0.21
	% of variance	0.16	4.00
	$\alpha$	N.S.	N.S.

N.S Not significant.





TABLE XVI  
CORRELATIONS OF SEGMENTED WITH WHOLE SCORES  
FOR GROUP C

Correlation of Part I, segmented, (a) (fixed), (b) (ani- mated) with Part II whole (animated) and Part III whole (fixed).			
(a)	CONCEPT 1	PART II (Whole) (ANIMATED)	PART III (Whole) (FIXED)
COMPRE- HENSION	PART I, SEGMENTED (FIXED)	0.65	0.64
	% of variance	42.00	40.00
	$\alpha$	.01	.01
	CONCEPT 1		
INTER- PRETATION	PART I, SEGMENTED (FIXED)	0.69	0.62
	% of variance	46.00	38.00
	$\alpha$	.01	.01
	CONCEPT 2		
(b) COMPRE- HENSION	PART I, SEGMENTED (ANIMATED)	0.54	0.38
	% of variance	29.00	14.00
	$\alpha$	.01	.05
	CONCEPT 2		
INTER- PRETATION	PART I, SEGMENTED (ANIMATED)	0.53	0.34
	% of variance	28.00	11.00
	$\alpha$	.01	.05



TABLE XVII  
CORRELATIONS OF SEGMENTED WITH WHOLE SCORES  
FOR GROUP B

Correlation of Part I, segmented, (a) (animated, (b)(fixed), with Part II whole (fixed), and Part III whole (animated).			
(a)	CONCEPT 1	PART II (Whole) (FIXED)	PART III (Whole) (ANIMATED)
COMPRE- HENSION	PART I, SEGMENTED (ANIMATED)	0.00	0.03
	% of variance	0.00	0.09
	∞	N.S.	N.S.
	CONCEPT 1		
INTER- PRETATION	PART I, SEGMENTED (ANIMATED)	0.01	0.06
	% of variance	0.01	0.36
	∞	N.S.	N.S.
(b)	CONCEPT 2		
COMPRE- HENSION	PART I, SEGMENTED (FIXED)	0.08	0.05
	% of variance	0.64	0.25
	∞	N.S.	N.S.
	CONCEPT 2		
INTER- PRETATION	PART I, SEGMENTED (FIXED)	0.17	0.00
	% of variance	2.00	0.00
	∞	N.S.	-

N.S. Not significant.



Table XVIII provides the information for the analysis of data for Group D. A cursory glance at that Table shows that, unlike the non-significant correlations for Group B, the correlations of D's scores are all significant, and that, therefore, some measure of prediction was possible.

Ferguson has pointed out that "In attempting to conceptualize the degree of relationship represented by a correlation coefficient it is more meaningful to think in terms of the square of the correlation coefficient instead of the correlation coefficient itself."<sup>3</sup> Working on this premise, the percentage of variance for each pair of correlated scores was calculated, as suggested by Ferguson,<sup>4</sup> using the values of  $r^2 \times 100$  for the values of  $r$  noted in Tables XV to XVIII.

Table XIX summarizes the information of Tables XV to XVIII according to concept. Thus, the percentage of the variance and the level of significance on Concept 1 are given for each of the four Groups for each pair of correlated scores. The same information is given on Concept 2.

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<sup>3</sup>George A. Ferguson, Statistical Analysis in Psychology and Education (second edition, McGraw-Hill Book Co., New York, Toronto, 1966), p. 127.

<sup>4</sup>Ferguson, loc. cit.



TABLE XVIII

CORRELATIONS OF SEGMENTED WITH WHOLE SCORES  
FOR GROUP D

Correlation of Part I, segmented, (a) (animated), (b) (fixed) with Part II whole (fixed), and Part III whole (animated).			
(a)	CONCEPT 1	PART II (Whole) (FIXED)	PART III (Whole) (ANIMATED)
COMPRE- HENSION	PART I, SEGMENTED (ANIMATED)	0.37	0.57
	% of variance	13.00	32.00
	$\alpha$	.05	.01
	CONCEPT 1		
INTER- PRETATION	PART I, SEGMENTED (ANIMATED)	0.40	0.47
	% of variance	16.00	22.00
	$\alpha$	.02	.01
	CONCEPT 2		
(b) COMPRE- HENSION	PART I, SEGMENTED (FIXED)	0.67	0.64
	% of variance	44.00	40.00
	$\alpha$	.01	.01
	CONCEPT 2		
INTER- PRETATION	PART I, SEGMENTED (FIXED)	0.65	0.69
	% of variance	42.00	46.00
	$\alpha$	.01	.01





TABLE XIX  
SUMMARY OF TESTS OF SIGNIFICANCE FOR CORRELATIONS,  
TABLES XV to XVIII

		CONCEPT 1		(WHOLES)		
		Groups	Compre- hension (Animated)	(Fixed)	Inter- pretation (Animated)	(Fixed) df
r concept 1 segmented (Fixed)	A		**	N.S.	**	N.S. 27
	C		*	*	*	* 30
r concept 1 segmented (Animated)	B		N.S.	N.S.	N.S.	N.S. 27
	D		*	**	*	** 30
		CONCEPT 2		(WHOLES)		
r concept 2 segmented (Animated)	A		**	*	N.S.	N.S. 27
	C		*	**	*	** 30
r concept 2 segmented (Fixed)	B		N.S.	N.S.	N.S.	N.S. 27
	D		*	*	*	* 30

\* Significant at the .01 level

\*\* Significant at or beyond the .05 level.

N.S. Not significant.



Concept 1

On Concept 1 , for both comprehension and interpretation, A's correlations were all low. The correlations of segmented fixed with animated whole (comprehension) and segmented fixed with animated whole (interpretation) were significant at the .02 level, while the corresponding correlations with fixed wholes showed non-significant differences. C's correlations on all of the above variables were consistently higher than A's, and were all significant at the .01 level.

B and D had Concept 1 segmented in the animated mode. On this concept, B's correlations for both comprehension and interpretation (segmented with wholes) were all very low, and showed no significant differences. D's correlations, on the other hand, even when they were not very high, were all significant. Its highest correlation was .57 between animated segmented and animated whole (comprehension).

A certain pattern is seen to emerge from the above analysis of the data of Table XIX. This pattern shows that on Concept 1, regardless of which mode was presented first in segmented form, predictability was more likely among groups that were unfamiliar with the modes than among groups that were familiar with either of the two modes. Again, prediction was better when the segmented presentation occurred first in the fixed than in the animated mode. Thus C had higher correlations in every instance than the other control group - D -, which viewed the segmented



mode first in animation. Similarly, Group A, having the fixed mode first, did better than B, which had the animated mode first.

### Concept 2

Here, A and C had the animated mode first in segmented form. A's correlations on comprehension were low but significant. On interpretation, however, the correlations were not significant. C's correlations on both comprehension and interpretation, are also low, but significant in every instance. It is of interest to note here that whenever a group had the animated concept first in segmented form, its correlations were always lower than when it had the fixed concept first in segmented form.

Thus, on concept 2 D had higher correlations than the other control Group - C. D, of course, took the segmented fixed concept 2, while C took the same concept in animation. Contrarily, D had lower correlations than C on concept 1, when C had that concept in the segmented fixed, while D had the same concept in segmented animated. This same pattern was evident for all other such comparisons of any pair of groups.

D's correlations on concept 2 are all significant at the .01 level. However, even though B had the fixed concept 2 first in segmented form, its  $r$ 's are all very low and non-significant.

The same pattern noted among groups on concept 1 was repeated on concept 2. That is, that both control groups had higher correlations than the two experimental groups. One





important point must be noted, however. Group A had virtually no r on its own mode (fixed) comprehension when it had the segmented concept 1 fixed first; but had a significant .01 correlation on its own mode when it saw the segmented concept 2 (animated) first. The only explanation that seems plausible is that concept 2, which was shown in Hypothesis IV to be the easier concept, and the order of presentation of the wholes - animated followed by fixed proved to A's advantage. In addition, A was also familiar with the fixed mode.

The above analyses of the data point to a partial and inconclusive acceptance of the hypothesis. The null hypothesis is therefore rejected for Groups D and C, and accepted for Groups A and B.

#### IX. SUMMARY OF RESULTS

1. Both animated and fixed films are capable of eliciting oral responses from purely visual stimulation.
2. Performance in respect of 'comprehension' and 'interpretation' of purely visual stimuli was significantly better on the fixed mode than on the animated mode.
3. When scores were compared inter-modally between groups, it was found that each group that was singularly familiar with a given mode performed relatively better on that mode than any other group.
4. Examination of the data showed that familiarity with a



mode was more noticeable on the variable 'structural and contextual accuracy' than on the variables 'comprehension' and 'interpretation'.

6. Order of presentation of the visual stimuli influenced differences in performance between and among groups.

7. Concept 2 was found to be easier than Concept 1 in both modes; and concept 2 (fixed) was easier than concept 2 (animated).

8. The control groups (C and D) had higher and consequently more significant correlations between segmented and whole scores than did the experimental groups.

9. Overall, Group C (control) and Group A (experimental) were the best and the worst groups respectively as regards performance in the tests.



## CHAPTER V

### CONCLUSIONS AND IMPLICATIONS

After analyzing the data, certain conclusions and observations were made. These are given as they relate to each of the hypotheses in turn.

#### HYPOTHESIS I

The type of visual stimuli presented (fixed or animated) does not significantly affect pupils' scores on (a) comprehension, (b) interpretation, (c) structural and contextual accuracy, (d) overall.

From the statistical evidence found, Hypothesis I was rejected. In every instance, both total and individual groups performed better on the fixed mode. Even when scores were influenced by other factors inimical to the fixed mode - a special order of presentation, a group's familiarity with another mode, or lack of familiarity with the fixed mode - the final differences in scores always favored the fixed over the animated mode.

It is therefore concluded that the fixed mode proved to be more effective than the animated mode for the testing of oral performance in French at the Grade 4 level. It is also concluded that the visual stimuli of the fixed mode seem to lend themselves better to comprehension and interpretation of their intended meaning than do the visual stimuli of the animated mode. The combination of language laboratory and film-



strips should be utilized more often for the testing of oral proficiency in second-language learning.

## HYPOTHESIS II

Familiarity with a given type of visual stimuli (fixed or animated) does not significantly affect pupils' scores on (a) comprehension, (b) interpretation, (c) structural and contextual accuracy, (d) overall.

The evidence found pointed to the rejection of this hypothesis. Over and above other operative factors, Group A exhibited a tendency to perform better on the fixed mode in relation to all other groups, and in relation to the animated mode. This was seen to be due to the Group's singular familiarity with the fixed mode. Group B's relatively superior performance on the animated medium (as reflected in the pattern of its gains) in inter-modal, intra-modal, and between-groups comparisons seemed to be due to B's singular familiarity with the animated mode.

The general conclusions for Hypothesis II were as follows: When groups were compared for familiarity or lack of familiarity with a given mode, the results showed a pattern that reflected the influence of a group's familiarity or lack of familiarity with that mode. When one mode was easier than another, a group that was singularly familiar with either mode performed relatively better on its familiar mode than groups not familiar with the mode.

Familiarity notwithstanding, all groups had higher scores on the mode that was easier. Therefore, the relatively superior





performance of each familiar group on its own mode could only have been attributed to familiarity. It is concluded then that in a testing situation such as that employed in this study, familiarity with the testing instrument may greatly determine how well pupils will perform.

### HYPOTHESIS III

The order of presentation of the visual stimuli (fixed or animated) does not significantly affect pupils' scores on (a) comprehension, (b) interpretation, (c) structural and contextual accuracy, (d) overall.

This hypothesis was rejected on the basis of the evidence presented in Tables VIII(b), IX, and X. When the differences between means for all four groups were examined individually between modes (Table VIII(b)) and comparatively among all possible paired combinations of groups (Tables IX and X), a systematic differential pattern was seen to emerge. This pattern suggested that the order of presentation of the visual stimuli did affect group scores.

Examination of this pattern showed that the order of presentation always favored a given group on the mode that that group saw last in comparison with any other group that saw that same mode first. Thus, Groups A and C, (separately and combined) always did better than Groups B and D (separately and combined) on the fixed mode; and Groups B and D (separately and combined) always did better than Groups A and C (separately and combined), on the animated mode (Tables IX and X). These



conclusions are based on the analyses of data for whole scores only (Parts II and III, Table VIII(a)).

When Table VIII(a) is examined in its entirety (Parts I, II, and III), it is seen that a further explanation can be given as to why the order of presentation favored Groups A and C on the fixed mode, and B and D on the animated. Groups A and C saw Concept 1 (segmented, fixed) at the very beginning of the test, followed by Concept 2 (segmented, animated). They then saw Concepts 1 and 2 (animated) whole followed by Concepts 1 and 2 (fixed) whole. Thus the first and last mode that they saw was the fixed. This mode has already been shown to be the easier mode. It was also the familiar mode of Group A (experimental). Added to this, Group C showed by its overall performance on both testing modes that it was superior to all other groups. All these favorable factors tend to suggest that the total pattern of the order of presentation shown in Table VIII(a) afforded Groups A and C an advantage over Groups B and D on the fixed mode.

This interpretation is all the more meaningful when it is noted that the alternate order of presentation favored B and D rather than A and C on the animated mode. It is therefore very clear that the order of presentation of the visual stimuli, however viewed, always resulted in relatively superior performance on the mode that was taken last.

Three other observations are worthy of note. The final scores of any given group showed one or more of the following



influences of the order of presentation:

A group's performance was enhanced on the mode taken last when

- ( i) in comparison with another group, it alone had an earlier viewing of one concept of that mode in segmented form;
- ( ii) in comparison with another group that also had the same previous viewing, it alone was familiar with the mode;
- (iii) it was alone in having had the previous conceptual viewing, and singularly familiar with the mode.

#### HYPOTHESIS IV

There is no significant difference between scores on concept 1 and concept 2 on either of the variables - comprehension, interpretation - in either the fixed or the animated mode.

The analyses of data of Tables XI, XII, XIII, and XIV all revealed findings that rejected the hypothesis. Intra-modally concept 2 was found to be easier than concept 1 in both modes. The order of presentation of all concepts, segmented and whole, greatly influenced the differences between scores of the control and experimental groups. The result of this influence was that Groups A and B were at a distinct advantage over Groups C and D on their respective familiar modes. Coupled with this advantage, order of presentation also favored the experimental groups in one form or another over the control groups.

At the same time, the control groups showed by their scores, that, without the favorable factors which influenced the





experimental groups on concept 2, this concept was indeed easier than concept 1 in either of the two modes.

Inter-modally, it was found that, over and above any other factors, concept 2 fixed was easier than concept 2 animated; and that concept 1 was easier to comprehend and to interpret in the fixed mode than in the animated mode. Consequently, the total group scores, as well as individual group scores all reflected the superiority of the second concept and the fixed mode.

#### HYPOTHESIS V

The comprehension or interpretation scores on a given concept viewed segmentally in either medium cannot significantly predict the comprehension, or interpretation scores on that concept viewed as a whole in either medium.

The actual testing of this hypothesis seemed, in retrospect, to have been on very weak ground. The findings concerning it were, therefore, not deemed conclusive enough to make any but tentative conclusions. In each of the two situations in which the hypothesis was tested the segmented concepts were the first visual cues presented to the testees. Moreover, in each case the segmented concept was seen only once, whereas its corresponding whole was seen thrice. Predictability of one score, knowing another, was not, therefore, entirely feasible. It would perhaps have been more equitable, and consequently more reliable statistically, if the Ss had been exposed to an equal number of segmented and whole viewings of the visual stimuli in question.



Nonetheless, it was possible to make some observations from the findings obtained. The predictability of the  $r$  coefficient in the case of the experimental groups A and B may have been better or more meaningful in a more rigorous testing situation. The same holds true for the two control groups. The correlation scores of both A and B, in the circumstances, indicate at any rate that there could be the likelihood of sound prediction in more congenial testing. This apart, the order of presentation of the concepts in segmented form and as wholes may have accounted for the kind of predictability that did result for the two experimental groups in spite of the apparent inequity of the correlative determinants.

From the results of the findings on both sets of correlative tests, the following tentative conclusions were made:

- ( i) Lack of familiarity with a given mode seems to enhance predictability, whereas familiarity with a mode seems to hinder predictability.
- ( ii) It may be easier to predict scores if (a) the diagnostic visual stimuli are relatively easy to understand; (b) the concept is easy.
- (iii) If the mode or the concept is difficult, predictability may be harder to achieve, especially if the correlative factors are not equally weighted.
- (iv) The testing instruments used in this study seemed to be potentially useful as a predictor of how well pupils are likely



to respond to a visual teaching and testing program in a foreign language, when the pupils have not been previously exposed to a visual program.

(v) Contrarily, the testing instruments do not seem to be a good predictor of performance in a foreign language, if the subjects are already familiar with a given visual or kindred visual mode.

#### GENERAL CONCLUSIONS OF OTHER HYPOTHESES IN RELATION TO HYPOTHESIS I AND HYPOTHESIS II

The findings of hypotheses II - V all supported, in some measure, the rejection of Hypothesis I. These findings indicated that in spite of the many confounding factors of a dual order of presentation, familiarity with a given mode, and variance in degree of difficulty between concepts, the fixed mode still proved to be more favorable for testing than the animated mode. The conclusions with regard to Hypothesis I are consequently valid.

Similarly, the "rejection" of Hypothesis II was well supported by the findings of the other four hypotheses. Type of visual stimuli notwithstanding, each familiar group did relatively better on the type of stimuli by which it was trained. Even when the order of presentation of the visual stimuli was unfavorable to a group, that group still succeeded in performing better on its own familiar visual stimuli. In addition, even when a concept proved to be easier in an



unfamiliar mode, a group performed better on that concept in its own mode.

There was thus abundant evidence that the experimental groups both profited from their singular familiarity with their respective modes. Conversely, the control groups, not being familiar with either mode, profited only from order of presentation, the facility of one mode over another, or from a combination of both these factors. These findings have strong implications for classroom use.

#### SUMMARY OF CONCLUSIONS

1. The type of visual stimuli used in testing oral proficiency in a foreign language greatly influences how well or how badly pupils perform orally in that language. When the visual stimuli are easily understood, oral performance tends to be better both with regard to what is said and to how it is said. Conversely, when the visual stimuli are difficult to understand, the difficulty experienced by the testees in understanding the stimuli is reflected in relatively poor performance.

2. Visual stimuli presented with the minimum of ambiguity as to their intended meaning, (a) largely determine how well those visual stimuli will be interpreted; (b) largely determine how closely individual differences in interpretation will approximate the intended meaning of the visual stimuli.





3. Although it has been found that both animated films and fixed films are capable of eliciting correct oral responses from purely visual stimulation, the fixed film does this more effectively. However, a group trained by animated films seems to have a much better chance of demonstrating its oral proficiency on fixed visual stimuli than does a filmstrip-trained group on animated visual stimuli. It appears that the nature of animated films is such that quick thinking is required to comprehend and interpret their meaning. Hence pupils trained by films are conditioned to react more quickly to filmed ideas and situations. The comparative slowness of the fixed film, coupled with its greater attention to detailed sketching, seems to act as an additional aid to a film-trained group in understanding and interpreting the concepts so presented.

4. Performance is enhanced in respect of 'comprehension', 'interpretation', and 'oral proficiency' when the concept is easy to understand and to interpret. Thus, the easier the concept, the better the overall performance.

5. In tests employing animated and fixed visual stimulation, the relative performance on each type of visual stimuli will be determined, in part, by which type of visual stimuli was presented first or last.

6. Since films cannot be too easily or readily presented in segmented divisions, it is difficult to attempt to use such a



method to predict performance on films presented in their entirety.

7. Contrarily, the presentation of filmstrips, frame by frame, may be a safe predictor of how well pupils are likely to perform when asked to relate a situation, which unfolds over a sequence of frames.

8. It appears that oral proficiency in French can be effectively tested by the separate or combined use of filmstrip and/or films alone, i.e. without sound.

However, this is yet to be validated since no attempt was made to assess the validity of the test results when compared to results on a known test.

9. The effectiveness of an audio-visual foreign language teaching program can be partially tested in respect of its goals by the use of its visual component only.

10. The use of visual stimuli alone is an effective way of testing how well pupils can verbalize in new contextual situations, in French, while using the vocabulary they already have at their disposal.

11. Both control groups showed a clearer understanding and superiority in interpretation of the visual cues than the experimental groups. One of two reasons may be advanced for this: (a) The control groups were more enthusiastic about the



novelty of the new testing media, and so performed better by concentrating more. (b) It would seem that being trained by non-audio-visual programs, the control groups had more class-time in which to use the foreign language in a wide variety of contextual situations. The experimental groups, on the contrary, were largely conditioned, even in their follow-up practice, after the filmed lessons, by the content of the particular audio-visual program by which they were trained. In addition, since a good deal of their classtime was devoted to watching the screen, they had little time left in which to practice the foreign language in class.

Another possible explanation is that the relative newness of audio-visual second-language teaching programs and the lack of experience of teachers in using such media for foreign language instruction, may have been a factor in the experimental groups not doing as well generally as the control groups. Nonetheless, even though in general the controls did better than the experimentals, in relative performance each experimental group did better on its own mode than any other group. The experimental groups' familiarity with their own mode accounted for this.

A few general observations will conclude this summary. The difficulty for the experimental groups lay, it seemed, not so much in their inability to comprehend and interpret the visual stimuli, but rather in their inability to do so in French.





This was probably due to the newness of the testing technique employed. They showed, however, that they could use the target language productively, even if at times what they did say had little bearing on what they saw. Frequently they gave responses that were contextually accurate for the particular audio-visual program by which they were trained. The conditioning in these programs may have been just too rigid. This rigid conditioning seemed to have accounted for pupils' inability to use known vocabulary outside of the contextual framework of their accustomed instructional mode.

The tendency to use English was greater among the control groups than among the experimental groups. This suggested that the experimental testees saw French and English as two completely different vehicles of expression. In this regard the audio-visual programs seem to be an effective but limited instrument for the initiation of truly co-ordinate bilingualism.

Pupils of the control groups frequently solved their difficulty in expressing their thoughts by a judicious and perfectly meaningful mixture of English and French. It appeared that they often used French only when it did not present an obstacle to quick and meaningful responses. Since this practice was widespread among the controls, one must assume that the pupils were allowed greater flexibility in their classrooms in expressing their thoughts in this manner. At the same time, it must be noted that these same pupils, sometimes used the correct French expressions in one situation or mode and then proceeded to use the French-English mixture for



identical expressions in another medium or situation. One can only assume, therefore, that even if they had the French vocabulary to cope with a given situation, there was no guarantee that such vocabulary would be used when a situation demanded it.

It was interesting to note, too, that the pupils of the experimental groups, when placed in similar circumstances, said nothing or used what French they could remember, whether it suited the context or not. They felt, it seemed, that it should be French or nothing.

#### IMPLICATIONS OF THE STUDY

In schools where second-language audio-visual programs are used for instruction, it would seem reasonable to advocate the use of visual stimuli alone as one means of testing oral proficiency in the target language. The emphasis of such testing lies in the fact that it places the onus of oral production on the pupil. In this way the teacher can be assured that the pupil is able to use the language without reliance on auditory assistance, which verbal stimuli imply. Expressing this in other terms, questions asked verbally have sufficient material to initiate verbal responses. It is therefore difficult to know whether the pupil would on his own have been able to phrase his response without the prior auditory cues in verbal questioning. Purely visual stimulation ensures that the pupil's replies or utterances are his own. Testing of this sort has another advantage: it forces the pupil to use known vocabulary in new situations.



Since communication is the prime purpose of language learning, tests must be developed that will show how well the learner can communicate in a variety of situations. The present study has established, beyond a doubt, that such testing is both worthwhile and possible. A number of such tests could be developed for use on pupils trained by any of a variety of audio--visual second-language teaching programs. An advantage of such tests would be that they could be used at different stages of language learning, whether among adults or children. Another advantage is that tests of this genre, as has been observed in this study, are capable of eliciting responses that are simple and correct, as well as responses that show a high degree of oral proficiency in the second-language. They may therefore serve as a useful instrument for measuring oral achievement insofar as concerns "spontaneous" oral production.

It is felt that the findings of this study are worthy of some consideration with regard to testing oral achievement in a second-language. Experts in foreign language testing, therefore, may be well advised to prepare other experimental tests in accordance with the findings of this study. These, of course, should in no way preclude tests that are concerned with other language learning skills. It would seem wise, too, for Universities to prepare teachers of foreign languages to make the most effective use of the audio-visual teaching materials available in their field of specialization. Since the trend in foreign language teaching is moving towards greater use of audio-visual materials, it is imperative that those using





such programs be well-prepared to use them efficiently. Only in this way can the effectiveness of the programs be assured.

This study has shown that tests of this sort can serve as an indicator of the standard of oral performance to be expected from pupils who have been trained by an audio-visual second-language program over a stated period of time. It seems too, to be a satisfactory means of testing oral proficiency of pupils, who have not had the benefit of audio-visual conditioning. Moreover, the study has indicated some of the problems to be encountered in respect of comprehension and interpretation of visual stimuli by pupils in the absence of their accompanying auditory crutch.

Finally, the present study should be a good starting-point for further and more intensive investigations along similar lines, at different age-levels. In addition, it suggests possibilities for testing foreign language learning that has been audio-visually conditioned.

#### RECOMMENDATIONS FOR FURTHER STUDY

In the light of the literature reviewed and of the findings of the present study, the following studies are presented for consideration:

1. Replication of the present study with larger groups.
2. A comparison of oral responses to auditory versus visual stimulation.
3. Measurement of prediction of whole scores from scores on segmented viewing in the fixed medium.





4. A comparison of the oral performance of adult beginners and young beginners in response to purely visual stimulation.
5. A study of pupils' reading performance, that has been conditioned by films and/or filmstrips.
6. Oral performance vs. understanding of the target language by pupils who have been audio-visually conditioned.



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## APPENDIXES



APPENDIX A  
THE PROPOSED PILOT STUDY

A randomly selected group of sixty pupils, drawn from a population similar to that from which the intended testees will be chosen, will be given a Pilot Study. This study will comprise pictures of the films and filmstrips to be used in the final testing. The pictures will be shown to the pupils frame by frame, in the case of the filmstrips, and in segmented sections in the case of the films. The pupils will then be required to say what is happening, who is speaking, what is the person saying, and so forth in relation to the context in which each situation is presented. This first portion of the Pilot Study will be called Part I.

In Part II of the Pilot Study the same pictures, as above, will be presented. Using the answers given by the pupils in Part I of the Pilot Study, the investigator will prepare a list of all the possible meanings and interpretations given for each picture. Each picture will then be shown to the pupils, and a list of all the possible responses, obtained in Part I for that picture, will be presented orally to the pupils. These latter will then be required to put a tick beside the corresponding number on the prepared sheets given to them to indicate what each pupil considers the best response to a given picture.





Based on the results of the two tests above, those items which seemed to have been too tricky or difficult to interpret will be discarded, and the necessary adjustments made to bring the items up to the required level of facility. The test films and filmstrips will then be constructed with these revised materials and presented to the Pilot Group. The pupils of this group will then be asked to relate in full the stories told by the two types of visual stimuli.

This being done, a check will then be made in order to see how many pupils performed well, and how many performed fairly well or badly. The tests will be accepted as good if between 58% and 65% of the pupils performed well enough to obtain more than 50% of the possible marks.

A visual discrimination test will then be made, using pictures from the films and filmstrips, outside of their final testing contexts. This test will be administered to the population from which the experimental and control groups are to be selected. The purpose of this test is to see how well the items presented visually, and out of context, are capable of eliciting automatically the same or similar responses among all the pupils.

The scores on the visual discrimination test will help to establish the reliability of the materials to be used in the final tests. Each item in the visual discrimination test will be checked for degree of difficulty. The answers given by the upper and lower quartiles of the pupils will also be checked. The assumption is



that if a pupil's total score is in the upper quartile (25%) then he is good at visual discrimination and at verbalizing about what he has perceived. One will then be able to correlate scores on the final tests between ability to enumerate items in isolation (i.e. out of context) and ability to synthesize these items into a coherent narrative, when visually stimulated.

The validity of the final tests can then be obtained by finding the validity coefficients on each testing mode in relation to a group which has been familiar with such given mode. The estimate of validity can be obtained by correlating the test scores on a given type of visual stimuli with which a given group has been familiar with the group's actual performance in the language class - e.g. Group A's scores on the fixed film stimuli can be correlated with Group A's actual performance in the language class - allowing for differences in performance due to the absence of the auditory conditioner in a purely visual testing program.



## APPENDIX B

## SHOOTING SCRIPT (CONCEPT I)

Scene: a living room.

Dramatis personae: a woman, two girls.

The woman is seated on a sofa (Upper Left) reading to her daughter. There is a big red ball on the floor, along with other toys. A little girl stands outside, looking into the living room through a glass in the door.

Daughter: (pointing at the door) Maman, regarde, il y a une petite fille à la porte!

Mother: (going to the door and addressing the little girl) Viens ici! (The little girl goes towards the mother). Qu'est-ce que tu veux, ma petite? (The little girl points to the ball on the floor). Eh bien, va jouer avec la balle.

(The little girl runs to the ball and takes it up. The older girl rises and advances towards the little girl.)

Daughter: Ne la touche pas, c'est ma balle! (grabbing the ball from the little girl).

Mother: (Shaking head at her daughter). Non, donne-moi la balle! (Daughter gives the ball to her mother and starts to cry).

The mother then gives the ball to the little girl who holds it to her heart and goes out to play with it. Mother goes to her room and returns with a doll, which she holds out to her daughter.

Mother: Ah, regarde! Voici une poupée, c'est pour toi.



Daughter: (Smiling as she takes the doll) Merci, maman, (She sits and plays with the doll).

## SHOOTING SCRIPT (CONCEPT 2)

Scene: An empty classroom at the end of the school day.

Dramatis personae: a man and a boy.

The boy is searching among a stack of books. Man enters quietly and stands looking at boy for some time.

Man: Qu'est-ce que tu cherches?

Boy: (looking up, surprised, shows a book he is holding). Un livre, monsieur.

Man: (pointing to book in boy's hand). C'est le livre que tu cherches?

Boy: Non, monsieur. Je cherche un gros livre, (indicating size of book with his hands).

The boy continues searching in the desks, and the man joins in the search, looking in his own desk.

Man: (showing a big red book) C'est le livre?

Boy: Non, monsieur.

(Man and boy continue search).

Man: (showing a blue book). Voici ton livre!

Boy: (looking up). Non, monsieur. (He shows man a yellow book, points to the color, and mimes 'Un gros livre').

Man: (nodding understandingly) Ah, oui. (He goes to his desk, takes out a large yellow book and says) - Voici ton livre!





Boy: (Runs up to man, takes the book, opens it, sees his name in it and says with a smile) - Oui, monsieur, c'est mon livre.

Man: Garde-le bien, mon petit. Au revoir! (waving to boy).

Boy: (returning wave, exit smiling) Au revoir, monsieur!



## APPENDIX C

## DIRECTIONS FOR ORAL PRODUCTION

## PART I

(Interpretation of individual frames (fixed mode), and Interpretation of individual entites (animated mode)).

"Good morning, boys and girls! Well, you have all been studying French this year, and now we would like to see how much you remember of the French you have learned, and how well you are able to speak it.

You will be shown a number of pictures on the screen, and also parts of a film. Look carefully at each picture or at each part of the film and say in French, in the microphone before you, what you think the picture or the part of the film you are seeing at any one time means. Say what you think is happening, what the people are saying or what they are doing. When you have finished speaking, stop the tape and look at the next picture or at the other portion of the film. Once the picture you are viewing has been changed, you must stop speaking; and stop the tape.

However, you are allowed ten extra seconds, after each part of the film has been shown, in order to finish saying what you want to say about that part of the film. You then proceed to talk about the next part of the film, when it appears on the screen.

It may be helpful if you imagine that you are telling a friend over the telephone what each picture or part of the film is all about. Remember, you must speak only in French! Best of



luck!"

## DIRECTIONS FOR ORAL PRODUCTION

### PART II

(Narration of story told by film)

If you put together all the parts of the film you just saw RED BALL<sup>1</sup> on the YELLOW BOOK, you will see that they actually tell a little story. We should like you now to look at the film again and see whether you can work out in your own mind what the story is all about. In order to make sure that you understand the story fully, we shall show the film three times.

During the first and the second showing, you must not say anything. Just look very carefully at the film; and try to understand what is happening. While the film is being shown the third time, you must tell us the story.

In order to help you to tell us the whole story, the film will be stopped from time to time. Every time the film stops, you will continue to tell us about that part of the story that you saw up to the time when the film was stopped.

Of course, you would have been telling the story while that part of the film was being shown. The other parts of the film will then be shown in exactly the same manner as the first part,

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<sup>1</sup> Say "Red Ball, or Yellow Book" depending on which concept is being presented at the time.





with pauses after each portion to allow you some time to finish telling that part of the story.

Remember, you are to tell the story as best you can, in French, to your friend on the telephone.

N.B. This story is about a woman, two girls, a ball and a doll.

This story is about a man, a boy, and a book.

## DIRECTIONS FOR ORAL PRODUCTION

### PART III

(Narration of story told by filmstrip).

"Look carefully, and you will see that all the pictures on the filmstrip about the RED BALL<sup>2</sup> 2 YELLOW BOOK, when shown very quickly, one after the other, actually tell a little story. We should like you now to look at the whole of that story as it is shown on the filmstrip, and see whether you can work out in your own mind what the story is all about. In order to make sure that you understand the story fully, we shall show it three times

During the first and the second showing, you must not say anything. Just look carefully at all the pictures; and try to understand what is happening. While the pictures are being shown the third time, you must tell us the story.

In order to help you to tell us the whole story, we shall

---

<sup>2</sup>Say "Red Ball, or Yellow Book" depending on which concept is being presented at the time.



show each picture for a few seconds so that you will have sufficient time to say what you want about the part of the story to which that picture refers. Apart from this, there will be no stopping between the presentation of the pictures, since all the pictures help to make up the story.

Remember, you are to tell the story as best you can, in French, to your friend on the telephone."

N.B. This story is about a woman, two girls, a ball and a doll.

This story is about a man, a boy, and a book.



## APPENDIX D

(INSTRUCTIONS TO STAFF CONDUCTING THE TESTS).

## ORDER OF PRESENTATION OF FILMS AND FILMSTRIPS

Monday, 6th May, 1968.

10 a.m.

Group A - St. Albert.

Group C - Saskatoon.

## PART I

1. Show pupils how to operate tape recorders.
2. Read appropriate instructions to testees.
3. Show filmstrip (1st concept - RED Ball - Frame by frame viewing.

Testees record their responses in accordance with instructions.

Duration: 5 - 6 minutes.

N.B. Each frame to be shown once only.

4. Read appropriate instructions to testees.
5. Show film (2nd concept - YELLOW BOOK - Segmented viewing.

Testees record their responses in accordance with instructions.

Duration: 5 - 6 minutes.

N.B. Each section to be shown once only.

BREAK OF TEN MINUTESPART II

1. Read instructions to testees.
2. Show film (concept 1 - RED BALL -) thrice.



3. Testees record during third showing and up to end of each pause.
4. Show film (concept 2 - YELLOW BOOK) thrice.
5. Testees record during third showing and up to end of each pause.

Duration: 6-7 minutes for each of nos. 3 and 5.

### BREAK OF FIFTEEN MINUTES

### PART III

1. Show filmstrip (concept 1 - RED BALL -) thrice.
2. Testees record during third showing.
3. Show filmstrip (concept 2 - YELLOW BOOK -) thrice.
4. Testees record during third showing.

Duration: 6-7 minutes for each of nos. 2 and 4.

REWIND TAPES.

Tuesday, 7th May, 1968

10 a.m.

Group B - Edmonton.

Group D - Saskatoon.

### PART I

1. Show pupils how to operate tape recorders.
2. Read appropriate instructions to testees.
3. Show film (1st concept - RED BALL -). Segmented viewing.

Testees record their responses in accordance with instructions.

Duration: 5-6 minutes.





N.B. Each section to be shown once only.

4. Read appropriate instructions to testees.
5. Show filmstrip (2nd concept - YELLOW BOOK -). Frame by frame viewing.

Testees record their responses in accordance with instructions.

Duration: 5-6 minutes.

N.B. Each frame to be shown once only.

BREAK OF TEN MINUTES.

PART II

1. Read instructions to testees.
2. Show filmstrip (concept 1 - RED BALL -) thrice.
3. Testees record during third showing.
4. Show filmstrip (concept 2 - YELLOW BOOK -) thrice.
5. Testees record during third showing.

Duration: 6-7 minutes for each of nos. 3 and 5.

BREAK OF FIFTEEN MINUTES.

PART III

1. Show film (concept 1 - RED BALL -) thrice.
2. Testees record during third showing, and up to end of each pause.
3. Show film (concept 2 - YELLOW BOOK -) thrice.
4. Testees record during third showing and up to end of each



pause.

Duration: 6-7 minutes.

REWIND TAPES.

---



## APPENDIX E

## DIVISION OF FILMS FOR VIEWING AND NARRATION

(CONCEPT 1 - RED BALL -).

1. Mother reading to girl. CUT WHEN LITTLE GIRL APPEARS AT DOOR.
2. Big girl notices small girl at door. CUT WHEN BIG GIRL POINTS.
3. Mother looks. CUT AS MOTHER LAYS DOWN BOOK.
4. Mother gets up and opens door. CUT AS LITTLE GIRL BEGINS TO ENTER.
5. Girl enters, and mother speaks to her. CUT AS GIRL POINTS.
6. Little girl picks up ball. CUT AS BIG GIRL RISES.
7. Big girl takes ball from little girl. CUT AS BIG GIRL THROWS BALL IN THE AIR.
8. Mother stretches forth hand for ball. CUT AS MOTHER RECEIVES BALL.
9. Big girl goes into corner, and mother gives ball to little girl. CUT AS LITTLE GIRL HOLDS BALL.
10. Little girl goes out. CUT AS MOTHER STARTS ACROSS ROOM.
11. Mother goes out. CUT DURING LONG PAUSE.
12. Mother brings doll. CUT AS GIRL TURNS.
13. Girl takes doll. CUT AS GIRL SITS.
14. Girl plays with doll.

FINIS.



## CONCEPT 2 - YELLOW BOOK -).

1. Boy searching. CUT WHEN SCENE SHIFTS TO DOOR.
2. Man enters. CUT AT ONCE.
3. Man walks across classroom. CUT WHEN HE IS AT FIRST DESK BY WINDOWS.
4. Man speaks to boy; boy rises, book in hand. CUT WHEN MAN POINTS TO BOOK.
5. Boy shows book and gestures. CUT WHEN MAN NODS.
6. Man and boy search. CUT WHEN BOOK EMERGES FROM DRAWER.
7. Man holds up red book. Boy nods negatively. CUT WHEN MAN PUTS BOOK ON DESK.
8. Man and boy search. CUT WHEN BOY IS AT PUPIL'S DESK IN FRONT OF TEACHER'S DESK.
9. Man holds up blue book. CUT AS BOY STRAIGHTENS UP.
10. Boy holds up yellow book and gestures. CUT WHEN MAN AND BOY BEND DOWN.
11. Both search. Man holds up yellow book. CUT WHEN BOY STRAIGHTENS UP.
12. Boy goes and takes yellow book. CUT AS BOY TURNS.
13. Boy examines book and nods affirmatively. CUT AS BOY CLOSES BOOK.
14. Boy goes away. CUT AS BOY REACHES EDGE OF FRAME.
15. Man waves... Boy waves. FINIS.





APPENDIX F

ENUMERATION OF THE MAIN FEATURES OF

CONCEPTS 1 and 2<sup>3</sup>

CONCEPT 1<sup>\*</sup>

1. Woman reading to girl.
2. Little girl coming into room to play with ball.
3. Objection by older girl to little girl playing with ball.
4. Restoration of ball to little girl by woman/mother.
5. Anger of big girl at having lost the ball.
6. Joy of big girl at receiving the ball.

CONCEPT 2<sup>\*</sup>

1. Boy searching among books.
2. Entry of man, and his question.
3. Boy's explanation.
4. Offer and refusal of books for different reasons.
5. Idea, resulting in finding of right book.
6. Acceptance of books and "farewells".

---

<sup>3</sup>In Concept 1, the story centers around a woman, two girls, a big red ball, and a doll.

In Concept 2, the story centers around a man, a boy and a big yellow book.

\*N.B. Recognition of these features determined pupils' scores on "Comprehension."



## APPENDIX G

ENUMERATION OF INTERPRETABLE FEATURES (INTENDED  
MEANINGS) OF CONCEPTS 1 AND 2<sup>4</sup>CONCEPT 1

1. Mother is reading book (story) to daughter.
2. Daughter sees little sister (little girl) at door and points to door.
3. Mother goes and opens door; and calls little girl.
4. Mother asks little girl what she wants.
5. Little girl wants something, which is on the floor. It is a big red ball.
6. Mother tells her she can go and play with the ball.
7. As little girl starts playing with ball, older girl takes it from her and plays with it by herself.
8. Mother in turn asks for and receives ball from older girl.
9. Older girl goes into the corner (by the door) and cries.
10. Mother returns the ball to the smaller girl, who goes out to play with it.
11. Mother goes into another room and returns with a doll.
12. Daughter goes and takes the doll, very pleased.
13. She thanks her mother, sits and plays with the doll.

CONCEPT 2

1. A boy (pupil) is searching for a book he has misplaced.



2. Teacher enters and asks boy what he is looking for.
3. Boy shows him a book/ says he is looking for a book.
4. Teacher asks whether the book the boy is holding is the one.
5. The boy says "No." He is looking for a big book.
6. Both continue the search.
7. Teacher shows a red book. Boy says "No."
8. Teacher shows a blue book. Boy says "No."
9. The boy shows a yellow book, indicates the color and mimes  
"A big yellow book".
10. Teacher gestures understandingly, goes to his desk and takes  
out a large yellow book.
11. The boy takes the book, reads something in it.
12. Boy smilingly acknowledges the book to be his.
13. Teacher waves goodbye, and boy returns the wave "Goodbye".

---

<sup>4</sup>Interpretation of these features determined pupils' scores  
on "Interpretation."



## APPENDIX H

## DISTRIBUTION AND CONVERSION OF MARKS ON

(a) COMPREHENSION, (b) INTERPRETATIONCOMPREHENSION

Raw Scores	Conversion to 5 point scale	Rating
6	5	Excellent.
5	4	Good.
3-4	3	Fair.
2	2	Poor.
1	1	Unacceptable.
0	0	Not attempted.

---

INTERPRETATION

12-13	5	Excellent.
9-11	4	Good.
5-8	3	Fair.
3-4	2	Poor.
1-2	1	Unacceptable.
0	0	Not attempted.





KEY TO COLUMN HEADINGS FOR RAW DATA

IDENTIFICATION SYMBOLS	DESCRIPTION
I.D.	Identification Data
Comp.	Comprehension
Int.	Interpretation
S. & C.A. (1 & 2)	Structural and Contextual Accuracy (concepts 1 and 2 combined)
Concepts 1      2	Concepts 1 and 2 separately



APPENDIX I

RAW DATA

SEGMENTED SCORES

Group A					Group C				
FIXED					ANIMATED				
Concept 1					Concept 2				
I.D.	Comp	Int.	Comp	Int.	I.D	Comp	Int.	Comp	Int.
1	1	1	1	1	55	4	4	3	4
2	1	1	1	1	56	5	5	2	1
3	1	1	2	1	57	3	3	3	3
4	1	1	1	0	58	2	1	3	3
5	0	1	1	1	59	3	3	3	3
6	0	1	0	0	60	5	4	4	4
7	0	1	0	0	61	3	3	3	3
8	0	1	0	0	62	2	0	2	0
9	0	1	1	0	63	2	1	3	2
10	0	1	2	1	64	1	1	0	0
11	0	1	1	0	65	4	4	3	3
12	0	1	1	1	66	2	3	2	1
13	0	1	0	0	67	2	1	0	0
14	0	1	0	0	68	3	2	2	2
15	0	0	1	0	69	3	3	3	3
16	0	1	1	1	70	3	1	2	1
17	0	1	0	0	71	1	0	0	0
18	0	1	1	1	72	2	2	1	1
19	0	1	1	1	73	2	2	0	0
20	0	1	1	0	74	2	1	2	1
21	0	1	0	0	75	4	3	3	3
22	0	1	1	0	76	3	2	1	1
23	2	1	0	0	77	3	3	2	3
24	3	1	0	0	78	0	0	0	0
25	0	0	0	0	79	3	2	2	2
26	0	0	0	0	80	4	2	2	2
27	1	1	1	0	81	4	3	1	1
.	.	.	.	.	82	4	4	3	2
.	.	.	.	.	83	3	2	2	1
.	.	.	.	.	84	2	2	1	2



APPENDIX I (continued)

RAW DATA

SEGMENTED SCORES

Group B					Group D				
ANIMATED					FIXED				
Concept 1					Concept 2				
I.D.	Comp.	Int.	Comp.	Int.	I.D.	Comp.	Int.	Comp.	Int.
28	2	1	1	0	85	1	1	2	3
29	2	1	1	1	86	1	0	3	3
30	1	1	1	1	87	1	0	2	1
31	1	1	0	0	88	1	1	2	1
32	2	1	2	1	89	0	0	1	1
33	1	1	2	2	90	0	0	2	2
34	3	1	2	0	91	1	1	2	2
35	1	0	2	1	92	3	2	4	4
36	2	1	2	1	93	3	3	3	3
37	1	0	1	1	94	0	0	2	2
38	1	0	1	1	95	1	1	1	1
39	2	2	3	3	96	0	0	1	1
40	1	0	1	1	97	1	1	2	1
41	1	0	1	1	98	1	1	4	4
42	0	0	2	2	99	1	0	2	2
43	1	1	0	0	100	0	0	1	1
44	2	1	1	1	101	0	0	2	1
45	2	1	0	0	102	1	1	3	3
46	3	3	2	1	103	2	2	3	3
47	2	2	3	3	104	0	0	3	3
48	2	1	1	0	105	1	1	1	1
49	0	0	2	1	106	0	0	2	2
50	2	1	0	0	107	0	0	1	1
51	0	0	0	0	108	0	0	2	1
52	1	1	2	1	109	2	1	1	1
53	0	0	2	2	110	1	1	2	2
54	0	0	2	2	111	3	3	3	2
.	.	.	.	.	112	0	0	0	0
.	.	.	.	.	113	2	1	1	1
.	.	.	.	.	114	1	0	2	1



APPENDIX J

RAW DATA

WHOLE SCORES

(Group A)

I.D.	ANIMATED		MODE		S. & C.A.	FIXED		MODE		S & C.A.
	COMP.		INT.			COMP.		INT.		
	Concepts		Concepts			Concepts		Concepts		
	1	2	1	2	(1 & 2)	1	2	1	2	(1 & 2)
1	1	2	1	1	5	0	2	0	2	4
2	2	2	1	1	8	1	2	0	2	5
3	2	2	1	1	8	3	3	1	3	9
4	1	1	1	1	4	0	2	0	2	4
5	1	1	1	1	4	1	3	1	2	8
6	0	1	0	1	2	0	1	0	0	2
7	2	3	1	2	7	3	3	2	3	10
8	1	1	1	1	4	0	2	1	2	5
9	1	1	1	1	6	2	2	1	2	6
10	2	2	1	1	7	3	4	3	3	10
11	2	2	2	2	7	3	3	3	3	8
12	1	2	1	1	4	0	2	1	1	4
13	1	1	1	1	6	0	1	1	1	4
14	0	1	0	0	1	0	3	1	2	8
15	2	2	1	1	9	2	2	1	2	8
16	3	3	2	2	10	2	3	2	2	10
17	0	2	1	1	2	2	2	1	1	7
18	1	1	1	0	4	2	2	1	1	7
19	0	2	1	1	6	2	2	1	2	10
20	2	2	2	2	10	3	3	2	3	11
21	0	2	1	1	4	1	2	1	1	6
22	1	1	1	1	4	1	3	1	3	8
23	2	1	1	1	7	0	0	0	0	0
24	3	0	1	0	6	3	3	3	1	9
25	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0
27	1	2	1	1	6	2	2	1	2	8





APPENDIX J (continued)

RAW DATA

WHOLE SCORES

(Group B)

I.D.	ANIMATED		MODE		S. & C.A.	FIXED		MODE		S. & C.A.
	COMP.		INT.			COMP.		INT.		
	Concepts		Concepts			Concepts		Concepts		
	1	2	1	2	(1 & 2)	1	2	1	2	(1 & 2)
28	1	3	1	2	7	2	3	2	2	8
29	1	1	1	1	5	1	2	1	1	5
30	1	2	1	2	7	2	2	2	1	8
31	2	2	1	2	6	2	2	1	1	5
32	3	4	3	4	12	3	3	3	4	13
33	2	2	2	1	7	2	3	3	3	12
34	2	2	1	1	7	2	2	1	1	8
35	1	3	1	3	9	3	3	3	3	10
36	2	2	2	1	7	2	3	1	2	8
37	1	1	1	1	5	1	0	1	0	4
38	1	1	1	1	7	1	2	1	1	6
39	2	4	2	3	12	3	3	3	3	12
40	1	2	1	1	7	2	3	2	2	13
41	1	2	0	1	4	2	2	2	1	8
42	2	2	1	2	7	0	1	1	1	4
43	1	2	1	2	6	2	2	1	1	8
44	1	2	1	1	6	2	1	1	1	6
45	0	1	0	0	1	0	1	0	0	2
46	0	0	0	0	0	1	3	1	3	7
47	3	4	3	3	13	3	3	3	2	10
48	2	4	2	3	12	1	2	1	2	5
49	2	3	2	2	10	2	2	2	2	10
50	5	5	5	5	17	4	5	4	5	17
51	3	3	3	3	8	4	3	3	3	10
52	0	0	0	0	0	0	0	0	0	0
53	0	0	0	0	0	2	3	1	3	8
54	2	3	2	3	4	2	3	2	3	9



APPENDIX 5 (continued)

RAW DATA

WHOLE SCORES

(Group C)

I.D.	ANIMATED		MODE		S. & C.A.	FIXED		MODE		S. & C.A.
	COMP.		INT.			COMP.		INT.		
	Concepts		Concepts			Concepts		Concepts		
	1	2	1	2	(1 & 2)	1	2	1	2	(1 & 2)
55	4	4	4	4	6	4	5	4	4	6
56	4	4	4	4	16	5	4	5	4	16
57	3	4	3	4	6	4	4	5	5	6
58	3	2	2	2	4	1	2	0	1	4
59	4	4	4	5	4	4	4	5	5	4
60	5	5	4	5	17	5	5	5	5	18
61	3	4	3	3	4	3	4	3	3	4
62	3	3	2	3	4	3	3	1	2	6
63	4	4	4	3	4	4	3	4	3	4
64	2	4	2	4	4	4	5	4	4	4
65	4	4	4	4	4	5	4	5	3	4
66	3	3	3	3	4	2	0	1	0	3
67	1	2	0	1	4	3	3	3	3	4
68	3	3	2	1	5	3	2	2	2	6
69	4	4	4	4	4	4	5	5	5	4
70	3	3	2	2	6	4	4	3	4	7
71	1	2	1	1	2	3	2	1	3	6
72	3	4	3	3	4	4	4	4	3	4
73	2	1	1	1	5	3	3	2	2	8
74	3	3	2	1	8	4	3	3	3	10
75	4	4	3	4	4	5	4	5	3	4
76	4	4	4	4	4	4	4	4	4	4
77	2	3	2	3	4	3	3	3	3	8
78	0	0	0	0	0	0	0	0	0	0
79	2	3	1	3	6	3	3	3	3	7
80	1	2	1	2	6	3	3	3	2	11
81	3	2	3	1	7	4	3	3	3	11
82	4	1	4	1	13	3	4	3	3	12
83	3	4	3	4	16	4	4	4	5	18
84	2	1	3	2	9	3	3	3	3	14



APPENDIX J (continued)

RAW DATA

WHOLE SCORES

(Group D)										
I.D.	ANIMATED		MODE		S.& C.A.	FIXED		MODE		S.& C.A.
	COMP		INT			COMP.		INT.		
	Concepts		Concepts			Concepts		Concepts		
	1	2	1	2	(1 & 2)	1	2	1	2	(1 & 2)
85	2	3	2	3	10	2	3	3	3	13
86	3	3	2	3	8	3	3	2	3	10
87	2	3	1	3	8	3	3	2	3	10
88	2	2	2	2	7	1	3	1	3	7
89	2	2	2	2	4	3	2	3	2	9
90	3	4	3	3	8	4	4	3	3	9
91	1	3	1	2	6	2	3	2	3	7
92	4	4	3	4	4	4	5	5	5	4
93	3	3	3	3	11	2	3	2	3	11
94	1	2	1	1	4	2	3	2	3	6
95	3	2	2	1	6	3	3	3	3	7
96	1	1	0	1	4	0	1	0	1	2
97	2	2	1	2	7	2	2	1	1	7
98	3	4	2	4	8	4	3	3	3	4
99	3	2	3	2	4	4	3	4	3	5
100	2	2	2	2	6	1	2	0	1	4
101	2	1	2	1	5	2	2	1	2	6
102	2	2	1	2	8	3	3	2	3	10
103	3	4	3	4	13	3	4	3	4	11
104	3	2	2	1	7	3	4	3	3	12
105	3	2	3	2	7	3	3	3	3	8
106	1	2	0	2	6	0	3	0	2	4
107	1	1	1	1	4	1	1	1	1	4
108	3	2	2	2	8	3	3	2	2	9
109	3	2	3	1	4	3	2	2	1	5
110	2	2	1	2	5	3	2	3	2	8
111	3	3	3	3	13	3	3	3	1	13
112	2	2	1	1	7	2	2	1	1	7
113	3	2	2	1	9	3	2	3	1	8
114	2	2	2	1	5	2	3	1	3	9











**B29893**